REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

1. AGENCY USE ONLY *(Leave blank)*	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED
	9 Mar 98	

4. TITLE AND SUBTITLE
INTERORGANIZATIONAL ADAPTATION, INTERORGANIZATIONAL STRATEGIES, AND FIRM PERFORMANCE

5. FUNDING NUMBERS

6. AUTHOR(S)
KURT A. HEPPARD

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
University of Colorado

8. PERFORMING ORGANIZATION REPORT NUMBER
97-044D

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
THE DEPARTMENT OF THE AIR FORCE
AFIT/CI, BLDG 125
2950 P STREET
WPAFB OH 45433

10. SPONSORING/MONITORING AGENCY REPORT NUMBER

11. SUPPLEMENTARY NOTES

12a. DISTRIBUTION AVAILABILITY STATEMENT

12b. DISTRIBUTION CODE

13. ABSTRACT *(Maximum 200 words)*

14. SUBJECT TERMS	15. NUMBER OF PAGES
	229
	16. PRICE CODE

17. SECURITY CLASSIFICATION OF REPORT	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT

INTERORGANIZATIONAL ADAPTATION, INTERORGANIZATIONAL STRATEGIES, AND FIRM PERFORMANCE

BY

KURT A. HEPPARD

B.S., United States Air Force Academy, 1982

M.B.A., University of California at Los Angeles, 1989

A thesis submitted to the

Faculty of the Graduate School of the

University of Colorado in partial fulfillment

of the requirement for the degree of

Doctor of Philosophy

Department of Business Policy and Strategy

1998

This thesis entitled:
Interorganizational Adaptation, Interorganizational Strategies,
and Firm Performance
written by Kurt Allen Heppard
has been approved for the Department of Strategy and Organization Management
in the Graduate School of Business Administration

Anne Sigismund Huff, Chair of Committee

Phillip K. Tompkins, Committee Member

R. Van Johnston, Committee Member

Christine S. Koberg, Committee Member

Julio O. De Castro, Committee Member

Date 10/7/97

The final copy of this thesis has been examined by the signators, and we find that both the content and the form meet acceptable presentation standards of scholarly work in the above mentioned discipline.

Heppard, Kurt A. (Ph.D., Business)

Interorganizational Adaptation, Interorganizational Strategies, and Firm Performance

Thesis directed by Professor Anne S. Huff

Firms are facing hypercompetitive environments where making adjustments is a crucial challenge for top managers. An unprecedented number of organizations are forming interorganizational relationships in order meet this challenge. This dissertation investigates adaptive interorganizational adjustments and interorganizational strategies. Based on an extensive literature review of adaptation theory, research hypotheses related to these central concepts are developed and tested.

In order to gather data, a questionnaire was constructed and sent to over 1,100 Chief Executive Officers in the aerospace, biotechnology & pharmaceutical, and electronic component industries. After the completed surveys were statistically analyzed, in-depth interviews about interorganizational relationships were conducted with Chief Executive Officers and later transcribed and reviewed.

The results of this dissertation indicate that top managers make intentional interorganizational adjustments, that the level of firm organizational adjustment is significantly related to the level of firm interorganizational adjustment, and that hierarchical interorganizational strategies provide greater flexibility than market-like strategies. This dissertation also finds that the firm's level of interorganizational adjustment is significantly related to financial performance.

This dissertation makes a significant contribution to both strategic management and organizational theory because it provides rare empirical research findings on interorganizational relationships. By demonstrating that a hierarchy of interorganizational adjustment exists, it supports the disputed contention that top managers pursue coherent interorganizational strategies. By finding a significant relationship between interorganizational adjustment and firm performance, it implies that interorganizational flexibility creates competitive advantage. Finally, it seriously challenges the popular belief that market-like interorganizational strategies increase the adaptive capacity or flexibility of firms.

CONTENTS

TABLES

Table

TABLES (CONTINUED)

Table

FIGURES

Figure

CHAPTER I

INTRODUCTION AND OVERVIEW

INTRODUCTION

Many firms today are facing hypercompetitive environments in which change is ubiquitous and where making adjustments is a crucial challenge for top managers and their organizations (Brown & Eisenhardt, 1997). Adaptation, a commonly used term for these adjustments, has been an important topic in the fields of strategic management and organizational theory for nearly forty years (Sharfman & Dean, 1997).

Most studies examining adaptation have focused on adjustments made within the organization and the impact of those adjustments on the firm's fit with the environment (eg. Koberg, 1987). Recently, however, an unprecedented number of organizations in many different industries have been forming interorganizational relationships in order to improve their ability to adapt to perceived changes in the competitive environment and to better serve their customers and constituents (Ring & Van De Ven, 1994).

Given the increasing importance of interorganizational relationships, I became interested in studying the types of interorganizational adjustments typically made by firms. As I began this research project, I was particularly interested in relating these adjustments to the existing body of research on firm

adaptation and alternative forms of interorganizational relationships. My goal was to discover and explain the interorganizationally adaptive firm.

In order to pursue this goal, I extensively reviewed the existing literature on interorganizational relationships and adaptation. I then conducted preliminary field interviews with managers and my academic colleagues, in order to develop the two key concepts explored in this dissertation: adaptive interorganizational adjustments and interorganizational strategies. Based on the literature review and my preliminary interviews, I developed research questions and hypotheses related to these central concepts.

In order to gather data and test the hypotheses, I constructed a questionnaire survey. The questionnaire was mailed to over 1,100 CEOs in the aerospace, biotechnology & pharmaceutical, and electronic component industries. After statistically analyzing the completed surveys, I conducted and transcribed in-depth interviews with CEOs from each industry and a management consultant with clients in high technology industries. These interviews provide greater detail regarding the survey outcomes and offer some possible explanations for results which were contrary to the predictions of adaptation theory.

The remainder of this chapter further summarizes my interorganizational research project as it is reported in this dissertation.

INTERORGANIZATIONAL ADAPTATION AND ADJUSTMENT

The level of academic interest in firm adjustment and adaptation has been somewhat cyclical. However, over the last few years there has been renewed interest in these issues given that organizational environments are perceived to be increasingly uncertain. Most recently, complexity theory and models of organizational agility, flexibility, and continuous change have stressed the importance of adjustment in the face of hypercompetitive environments (Stacey, 1995; Brown & Eisenhardt, 1997). This dissertation begins by examining the evolution of adaptation models and adaptive adjustment from their early roots in contingency theory through its latest extensions in theories of continuous change.

This study recognizes that interorganizational issues are becoming increasingly important to both managers and researchers alike. The set of adjustments that firms make in their relationships with other firms is an emerging focus of adaptation models. These interorganizational adjustments have been widely discussed in the academic literature as well as in the popular press. However, relatively little empirical research has been done.

In many past studies of adaptation and adjustment, interorganizational relationships were treated as if they were part of the firm's external environment. As interorganizational relationships and strategies become increasingly important in the discussion of managerial direction of the firm and its strategy, it seems particularly important to separate the firm's direct interorganizational relationships from the general environment. This dissertation clearly makes this separation and contributes to the investigation of the interorganizational domain.

Based on the principle of minimum intervention, the dissertation develops, tests, and finds strong support for the idea that a hierarchy of interorganizational adjustments exists that range from integrated, hierarchical relationships to disaggregated, market-like interactions. It finds similarities between interorganizational adjustment and organizational adjustment which can be explained by characteristics of the perceived environment, the organization, and the top manager.

Most descriptions of interorganizational strategies and relationships place disaggregated (market-like) interorganizational strategies at one end of a continuum of relationships and integrated (hierarchical) interorganizational strategies at the other. The market-like end of the continuum is described as highly competitive. This is where independent, vertically disaggregated firms have many shifting relationships with other firms. In contrast, the hierarchical end of the continuum is characterized as highly cooperative. This is where dependent, vertically integrated firms have a small number of highly stable interorganizational relationships. Between these extremes on the continuum, network interorganizational relationships with varying levels of competition, cooperation, integration, and interdependence are described. This dissertation further develops the dichotomy between market-like and more integrated interorganizational strategies and presents the surprising research finding that hierarchical interorganizational strategies are related to higher levels of adaptive interorganizational adjustment than market-like strategies.

An additional contribution made by this dissertation to the discussion of interorganizational relationships is the potentially important link between the level of adaptive interorganizational adjustment and firm performance. There is preliminary evidence that firms with high levels of interorganizational adjustment are performing better financially than firms with lower levels of interorganizational adjustment.

DISSERTATION MODEL AND RESEARCH QUESTIONS

This study uses adaptation models to frame the critical issues of interorganizational adjustment, interorganizational strategies, and firm performance. Over the years, researchers have discussed adaptation from a number of theoretical perspectives, including contingency theory, the strategic choice view, population ecology theory, configurational models, strategic renewal, and complexity theory. This dissertation adopts the strategic choice view of the adaptation model and extends Koberg's work on adaptive organizational adjustments (1987) to the interorganizational level. The dissertation is based on a model of adaptive organizational adjustments shown in Figure 1.1.

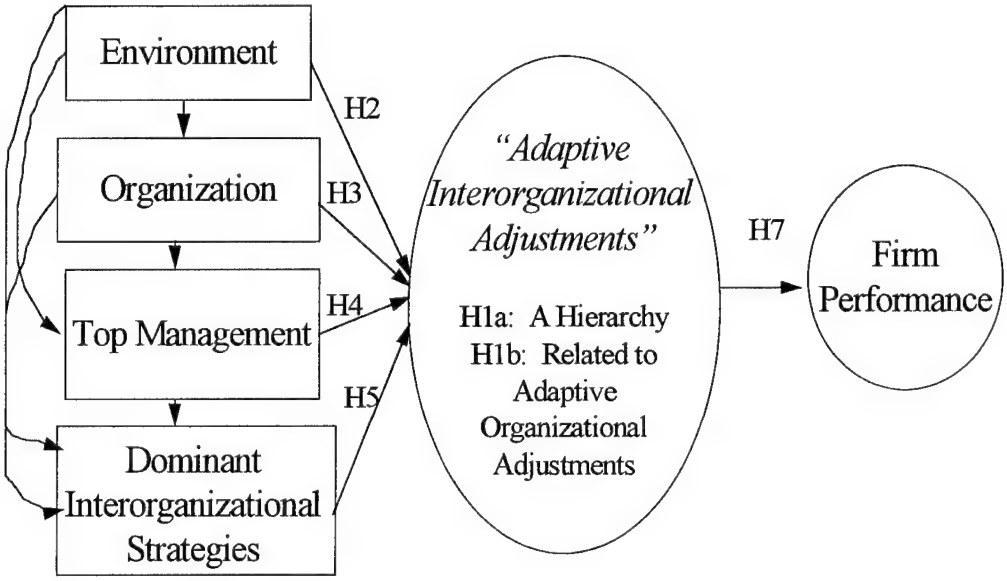

Figure 1-1 Dissertation Model

While the variables and hypotheses which comprise this model are developed in significant detail in Chapter III, a brief discussion of the model is useful at this point in the dissertation.

At the heart of the model are "adaptive interorganizational adjustments." These comprise the "repertoire" of interorganizational adjustments which may be made by a firm. Adaptive interorganizational adjustments include modifications in vendor and suppler relationships, adjustments to short term alliances, adjustments to cooperative marketing, distribution, or production agreements, adjustments to licensing and shared-equity arrangements, and adjustments to joint ventures. The first research question addressed in this dissertation concerns these adjustments and how they are employed by top managers:

Is there a hierarchy of interorganizational adjustments that reflects the intentional motives of managers?

In addition to a repertoire of interorganizational adjustments, firms may make a number of organizational adjustments. Miles (1975) and later Koberg (1987) described these organizational adjustments as procedural, personnel-related, process-related, structural, and strategic. It is interesting to speculate about possible similarities and differences in these two broad categories of adjustments. This speculation leads to the second research question in this dissertation:

Is there a relationship between organizational adjustments and interorganizational adjustments?

Given the theoretical assumption that interorganizational adjustments are intentionally chosen by managers, it is important to investigate whether various characteristics which have been related to organizational adaptation and adjustment in previous research are also related to interorganizational adjustments. The influence of the environment (uncertainty, heterogeneity, munificence, and price competition); the organization (centralization, strategic type, scanning, structure, internal control, and external control); the top manager (age, tenure, locus of control, managerial philosophy); and the interorganizational strategy (market-like, hierarchical) are considered in the third research question addressed by this study:

Are characteristics of the environment, organization, top manager, and interorganizational strategy related to the level of interorganizational adjustments made by the firm?

The financial performance of a firm is of great importance to many managers and researchers (particularly researchers in strategic management). Managers are expected to make adjustments in order to enhance the financial performance of their firms. This dissertation model considers this relationship to firm performance in response to the following broad research question:

Is there a relationship between the level of interorganizational adjustment and the financial performance of the firm?

Finally, in its investigation of interorganizational relationships, this dissertation analyzes Miles & Snow's (1986) dynamic network characteristics. This study uses factor analysis to determine whether these characteristics measure a single organizational construct. The study also uses these characteristics to develop a predictive model of market-like interorganizational strategies in order to provide a partial answer to the final research question:

Can valid and reliable measures of interorganizational relationships be developed from existing theoretical discussions?

KEY DISSERTATION TERMS

The vocabulary of adaptation, adjustments, relationships and strategies is complex, sometimes ambiguous, and can become confusing. The following table of key dissertation terms is offered to help avoid such confusion and to assist the reader in understanding how key organizational and interorganizational terms are used in this dissertation.

Table 1-1
Key Dissertation Terms

Adaptation	The process by which an organization makes adjustments in order to create fit with the environment.
Organizational Adaptation	Adjustments made within a given organization in order to create fit with the environment.
Interorganizational Adaptation	Adjustments made between organizations in order to create fit with the environment.
Adjustment	Actions initiated by managers in order to pursue goals of adaptation or enhanced performance.
Organizational Adjustment	Actions initiated within an organization such as changes in general procedures, personnel, organizational processes, organizational structure, or overall firm strategy.
Interorganizational Adjustment	Actions initiated in relationships between firms such as changes in vendor/supplier arrangements, short term alliances, cooperative marketing, distribution, or production agreements, licensing and equity investments, and in joint ventures.
Flexibility	The firm's ability to adapt as evidenced by the number of organizational and interorganizational adjustments made
Interorganizational Relationships	Agreements and interactions between organizations
Interorganizational Strategies	An integrated and coordinated set of interorganizational commitments and actions designed to achieve competitive advantage.

DISSERTATION OUTLINE

In order to effectively present the theoretical development, execution, and results of this study of interorganizational adjustments, interorganizational strategies, and firm performance, the dissertation is organized into six chapters.

Chapter I: Introduction and Overview

In this, the introductory chapter, a general overview of the study is provided, the key research goals are discussed, the dissertation model and related questions are identified, and the basic research strategy of the study is described.

Chapter II: From Contingency to Complexity

Chapter II begins by defining adaptation as the term is used in this dissertation and proceeds to integrate the concepts of interorganizational relationships and adaptation. It then provides an extensive literature review of how the concept of adaptation has been framed and investigated over the last several decades. The review basically follows the chronological development of adaptation theory. It begins with a discussion of contingency theory, describes the emergence of population ecology theory, introduces the strategic choice view of adaptation, highlights parallels between strategic choice and the field of strategic management, and notes the increasing importance of interorganizational relationships in the strategic choice model. The chapter then describes organizational types and configurations, and presents views of adaptation which have become popular in the 1990s including strategic renewal, continuous change,

and complexity theory. The remainder of the chapter covers the actual process of adaptation and the theoretical approach used in the dissertation.

Chapter III: Theoretical Development of Research Hypotheses

Chapter III provides an in depth theoretical development of the dissertation model by deriving research hypotheses from the broad research questions introduced in Chapter I. It explains the principle of minimum intervention and its importance in studying the intentionality of interorganizational adaptation. The expected relationship between organizational adjustments and interorganizational adjustments is described. The chapter continues by developing specific hypotheses outlining the expected relationships between characteristics of the environment, the organization, top managers, interorganizational strategy, and the level of interorganizational adjustment. I also argue that there will be a significant relationship between the level of interorganizational adjustment and financial performance. The chapter concludes with hypotheses which, if supported, would validate Miles & Snow's description of dynamic network characteristics.

Chapter IV: Research Design and Methodology

Chapter IV provides a detailed explanation of the research design and methodology used to test the hypotheses developed in Chapter III. It begins by describing how the research methodology was selected and argues for the importance of a multilectic approach in the dissertation. This chapter then

explains how the mail survey (which forms the empirical foundation of this study) was conducted including discussions of how the sample was selected, expected response rates, the industries surveyed, the design and construction of the questionnaire, and the actual mail survey response rates. Detailed coverage of the variables studied and the items on the questionnaire are included. The chapter ends with a discussion of the role of follow-up interviews in the study and how these interviews were conducted.

Chapter V: Data Analysis and Results

Chapter V reports the results of the data analysis and states the empirical findings for each hypothesis developed in Chapter III. The beginning of the chapter describes how data from the questionnaire was examined and comments on the quality of the collected data and whether it meets the assumptions necessary for the planned statistical analyses. The chapter then discusses the statistical tests used to examine each hypothesis and systematically reports the findings for each research hypothesis. Throughout the chapter, representative quotations from the interview phase of the study are included to add depth and texture to the statistical results.

Chapter VI: Results and Future Research Issues

Chapter VI highlights the most important findings of this research project and discusses their impact on theory and practice. The hierarchy of

interorganizational adjustments found in the survey is reported along with a rank ordering of factors affecting interorganizational choices. The potential link between the level of adaptive interorganizational adjustment and firm performance is explored.

ADAPTIVE INTERORGANIZATIONAL ADJUSTMENTS

I've made a conscious effort in this dissertation to link ideas from the fields of strategic management and organizational theory as they apply to managerially directed adaptation and adjustment at the interorganizational or "meso level" of analysis. I think integration of these fields at the this level is important and follows the spirit of the following observation:

> "Organizational theorists...are interested in exploring organizational structures and systems. It is both interesting and puzzling that strategic management and organizational theory researchers study the same phenomenon (and report their results to the same audience) but work independently of each other. Rarely does either group reference the other's work, nor have they employed the same variables or tested each other's theories....we believe researchers in both fields would benefit from a more conscious cross-fertilization of efforts" (Huff & Reger, 1987: 221-222).

The interorganizational level of analysis provides an opportunity for this cross-fertilization which is promising and important for organizational theorists and strategic management researchers alike. Researchers in the field of organizational theory and strategic management have typically focused on either macro or micro levels of analysis. The macro level includes the environment (organizational theory) or industries and strategic groups (strategic management)

while the micro level concerns individual organizations (organizational theory) or firms (strategic management). Interorganizational relationships occur at a meso level (House, et al., 1995) which falls between the macro and micro levels. Research at the meso level focuses specifically on interorganizational relationships, adaptive interorganizational change, constellations of firms along value chains, and emerging organizational and interorganizational forms.

In investigating this meso level of organizational interaction, it is important to develop and test effective measures of interorganizational constructs. This study does so by focusing on Miles & Snow's description of interorganizational networks (1986; 1994). It tests whether it is possible to predict the broad interorganizational strategy of a firm based on the degree to which managers report market-like (dynamic network) characteristics. Some limited support for the Miles and Snow description is found but the model is little better than chance at predicting the interorganizational strategies reported by CEOs.

Another potentially valuable contribution of this study is its examination of the implied relationship between the level of interorganizational adjustment and firm performance in environments perceived to be dynamic or hypercompetitive. In the past, most research linking firm adjustment and performance has neglected the meso level of firm interaction and has focused on the creation of fit with the environment or selection of industry. While fit is still a viable concept and selection of industry matters, the most recent theories of adaptation assume that environments are constantly changing. Therefore, managers need to envision

adjustment, particularly interorganizational adjustment, as a continual, meso level process.

My research specifically examines the relationship between characteristics of the macro environment, the organization, top management, interorganizational strategy, and adaptive interorganizational adjustments. These are characteristics of special interest to adaptation researchers in the fields of organizational theory and strategic management. This dissertation organizes previous research and extends previous work on organizational adaptation to the meso level and adaptive interorganizational adjustments.

This study finds that a hierarchy of interorganizational adjustment exists and that organizational adjustments and environmental scanning are characteristics most closely related to the level of interorganizational adjustments made by firms. This study makes a unique contribution to the meso level scholarly conversation about adaptation by developing a dichotomy of interorganizational strategies and finding, contrary to theoretical predictions, that market-like (disaggregated) interorganizational strategies are related to lower levels of interorganizational adjustment than hierarchical (integrated) interorganizational strategies.

CHAPTER II

FROM CONTINGENCY TO COMPLEXITY: THEORETICAL PERSPECTIVES ON ADAPTATION

INTRODUCTION

This chapter reviews the diverse literature on adaptation. Because little research has been specifically devoted to interorganizational adaptation (or the meso-level of firm accommodation with the environment), the theoretical framework for this study is the extensive body of research into how organizations adapt in order to create fit with their environment. To be sure, there is a vast amount of research on interorganizational relationships. However, this research adopts various theoretical perspectives and does not provide an integrated model upon which empirical research on interorganizational adjustment may be developed.

Initially, this chapter introduces the concept of adaptation and then traces its historical roots from contingency theory through complexity theory and the theories of continuous change which are evolving today. It reviews the most prominent theoretical perspectives associated with adaptation and highlights the strategic choice perspective as the theoretical foundation for the study. The chapter stresses the importance of broadening the discussion about adaptation to include the interorganizational level of adjustment or change. The chapter also reviews research specifically related to the process of adaptation and describes

where the analysis of interorganizational adaptation fits within this body of research. More specifically, this chapter argues that previous work on the intentionality of organizational adaptation is a promising beginning for understanding interorganizational adaptation.

ADAPTATION AND INTERORGANIZATIONAL ADJUSTMENT

For several decades, an important part of the organizational theory and strategic management literature has been the study of changes that organizations make in order to adapt to perceived shifts in the environment and to select or create more favorable environments in which to compete (Burns & Stalker, 1961; Chandler, 1962; Andrews, 1971; Hrebiniak & Joyce, 1985; Ginsberg & Buchholtz, 1990; Huff, Huff, & Thomas, 1992; Sharfman & Dean, 1997). Recently, the importance of proactive and continuous organizational change has been stressed (D'Aveni, 1994; Brown & Eisenhardt, 1997). The theoretical discussions regarding this firm level change have typically been centered around the construct of adaptation. However, in this academic conversation about organizational change, the term adaptation has been used with a number of meanings.

The term adaptation has been used to describe a process whereby managers adjust the scale of operations or organizational structure to their immediate environment through a process of gradual, or incremental response to changes in the environment (Tushman & Romanelli, 1985). In other studies, the term has been broadened to include more radical, frame breaking change

(Jennings & Seaman, 1994). In this dissertation, adaptation is used as a theoretical construct and general term for the process of the accommodation (operationalized as organizational and interorganizational adjustments), both incremental and radical, between an organization and its environment, including the selection or creation of competitive environment (Lawrence & Dyer, 1983).

Several researchers have claimed that organizational change and adaptation are among the central themes of organizational research (Jennings & Seaman, 1994). Chakravarthy (1982) argued that the study of strategic management is the study of adaptation and stated that organizational fit with the environment results in superior performance. This analogy to strategic management is based on the premise that top managers seek to create successful organizations by selecting an appropriate strategy based on their perception of the firm's external environment (Andrews, 1971).

Although much of the adaptation literature implicitly assumes that perceived characteristics of the environment are related to organizational adjustments, relatively little empirical research has been accomplished to test these assumptions (Zajac & Shortell, 1989; Boeker & Goodstein, 1991; Jennings & Seaman, 1994). Even fewer studies have simultaneously considered the relationship between organizational adjustments and characteristics of the environment, organization, and top managers (Koberg, Chesley & Heppard, 1995). No published empirical studies to date have considered interorganizational adjustments and characteristics of the environment, organization, top managers.

This dissertation fills this void in research related to adaptation and interorganizational relationships.

The examination of interorganizational adjustment and adaptation is important as firms focus on their core competencies and rely on external relationships such as alliances and outsourcing to complete or enhance the firm's value chain. When compared with the extensive research on adaptation at the organizational level, the issue of interorganizational adaptation is relatively new territory for both researchers and top managers. By using the theoretical foundations of organizational adaptation to make predictions about interorganizational adjustment and change, this dissertation provides some preliminary but important ideas about how organizations make adjustments (or fail to make adjustments) in relationships with other firms and the possible connection between these adjustments and firm performance.

THEORIES OF ADAPTATION

Adaptation has been a key area of organizational research for nearly fifty years. While there has been consistent interest in how organizations change to fit the perceived environment or how they select environments, the number studies conducted and articles published has been somewhat cyclical. The topic enjoyed a great deal of interest in the 1960s, a renewed period of interest in the 1980s, and has "become a pivotal strategic competence for many organizations" (Eisenhardt & Tabrizi, 1995: 84) in the 1990s (Eisenhardt, 1989; Stalk & Hout, 1990).

Perhaps one of the reasons for the current resurgence of interest in firm adaptation is the increasing level of interest in competitive strategies for hypercompetitive environments (D'Aveni, 1994) and the rapidly changing, "new competitive landscape" (Bettis & Hitt, 1995). Brown and Eisenhardt have recently used complexity theory to develop strategies of continuous change for firms in rapidly changing environments (1997).

There seems to be a common theme in these evolving theories of organizational relationships with rapidly changing environments: *The importance of interorganizational relationships and strategies.* In nearly all discussions of new competitive landscapes or emerging organizational forms, theorists and managers highlight the importance of interorganizational relationships in maintaining a competitive advantage for the firm. As researchers and managers search for theoretical perspectives and models to investigate how firms might "compete for the future," (Hamel & Prahalad, 1994) within the context of "hypercompetitive environments," (D'Aveni, 1994) the existing academic literature on adaptation and change is critically important. The following theories of adaptation have evolved over the last fifty years and provide a valuable way to think about and empirically examine interorganizational responses of firms to the volatile environmental conditions described by many current researchers in the fields of organizational theory and strategic management.

CONTINGENCY THEORY

Most of the important contributions to the study of organizational adaptation between 1950 and 1980 came from contingency theorists. Contingency theory seeks to develop an understanding of which organizational structures would ensure the long term survival of the firm. These early adaptation theorists believed that one of the most important responsibilities of a manager was to adjust the organization's operations or structures in order to maintain fit with the external environment. Contingency theorists held that continuing fit between an organization and its environment would lead to survival and enhanced organizational performance.

These theorists also made primarily deterministic assumptions about organizations and their environments. The environment, and to a lesser extent the organization, were seen as fixed and managers reacted to these fixed structural constraints (Astely & Van de Ven, 1983). The environment was believed to impose requirements for efficiency, innovation, and adjustments which the organization had to make in order to survive (Hage & Aiken, 1970). In other words, these contingency theorists believed that managers could make limited changes in their organizations which would create "fit" with the environment.

The notion of fit is complex but it basically means that an organization's structure and processes conform to pressures from the environment in which the organization operates. There is an implicit assumption here that organizations that achieve fit with the environment will perform better or be more effective than firms that fail to match the environment and therefore suffer from misfit.

Burns & Stalker: Mechanistic and Organic Organizations

One of the earliest and most important contributions by contingency theorists was Burns & Stalker's (1961) development of a theory which classified organizations as either "mechanistic" or "organic." The selection of either a mechanistic or organic structure was dictated by the environmental conditions faced by an organization. In environments where conditions were relatively stable, organizations were thought to benefit from mechanistic structures characterized by traditional hierarchies, formal bureaucratic rules, vertical communication, and highly structured decision rules or decision making.

Alternatively, in more dynamic or turbulent environmental conditions in which change was widespread and rapid, an organization's chances of surviving and performing well were thought to be enhanced if organic structures were used. Organic organizational structures are characterized by less hierarchical rigidity, high levels of communication (vertical and horizontal), greater participation by workers throughout the organization in decision making, and a greater opportunity for organizational members to consistently define and re-define their relative positions.

Contingency Theory and Technology

Joan Woodward (1965) was important in the development of contingency theory because her research indicated that differences in an organization's technology were related to differences in organizational structure. Woodward

distinguished between custom, mass, and continuous technologies and discussed their relationship to structural contingencies (1965).

Thompson (1967) also studied technology in the context of contingency theory. He found that the dominant technology used by an organization had a strong influence on an organization's structural activities and its evaluation and control processes. Thompson differentiated long-linked technology (where there is sequential interdependence), mediating technology (where there is pooled interdependence), and intensive technology (where there is reciprocal interdependence). In addition to this discussion of technology, Thompson was also one of the first researchers to advocate the buffering of internal organizational actions or core technologies from the external environment.

Adaptation as an Organizational Process

Lawrence & Lorsch (1967) established the perspective that adaptation was an organizational process initiated by managers who modified operations, procedures, structures and practices in order to meet the demands of the changing environment. Lawrence and Lorsch believed that the central problem faced by managers was to achieve an organizational balance between the integration or differentiation of organizational subunits. In highly complex environments, organizations needed to be highly differentiated. Given this high level of subsystem differentiation, Lawrence and Lorsch found that managers would need to work harder on integrating these subsystems within the organizations.

Terraberry (1968) did important research which helped advance the understanding of adaptation models. Based on the framework developed by Emery and Trist (1965), she focused on two key elements of the environment (the rate of change and the degree to which elements in the environment were interconnected) and developed two key hypotheses. The first hypothesis was that organizational change was caused by the external environment. The second hypothesis was that successful adaptation was related to organizational adjustments made by key members of the organization in response to changes in the external environment. She also found that as environments became more complex, it became more difficult for key members of the organization to make appropriate decisions and that organizational design in highly complex environments would reflect that environmental complexity.

Contingency Theory in the 1990s

A recent resurgence of interest into structural contingency theory has been led by Lex Donaldson's development of a structural-adaptation-to-regain-fit (SARFIT) model (1995) and his argument for a positivist organization theory (1996). In the SARFIT model, Donaldson describes a cycle in which organizations begin to lose fit because of changes in various contingency variables. This decrease in fit leads to a decline in firm performance. After recognizing this organizational misfit or poor performance, managers make adjustments in the organization to create new fit with the environment. Donaldson uses empirical evidence to support his claims that fit between the

organization's structure and its environment or strategy (contingency) affects performance. Changes in the contingencies lead to misfit, misfit encourages structural change, and structural change leads to new fit (1995).

POPULATION ECOLOGY THEORY

In the mid-1970s, the view that is commonly known as the population ecology theory of adaptation was articulated (Hannan & Freeman, 1977). This theory began with a stinging critique of contingency theory and its emphasis on organizational change, learning, and managerial rationality. Population ecology views have become increasingly popular and widely accepted over the past twenty years. Given a population ecology perspective, organizational change is seen as unlikely because organizational assets tend to be task specific, top managers have only partial information about the organization and its environment, their perceptions of both the organization and the environment may be seriously flawed, change is constrained by political pressures within the organization, and major change may be too expensive for firms to contemplate (Hannan & Freeman, 1977).

Selection by the Environment

Population ecology has a very different view of adaptation than other organizational theories regarding the fit between an organization and its environment. While other organizational theories conclude that individual organizations adapt their own characteristics to match their environment

(Thompson, 1967) or that organizations enact or choose the environments in which they will compete (Child, 1972; Weick, 1987), the population ecology view consider opportunities for adaptation by individual organizations as extremely limited (Hannan & Freeman, 1977). Population ecologists find that the environment "selects" the firms that have the characteristics that are needed for survival and that firms which don't have these characteristics are "selected out" of the population or die (Hannan & Freeman, 1977). Individual firms are not adaptive. Environmental selection determines which populations of firms will survive.

Population Ecology and the Process of Adaptation

Howard Aldrich is one of the leading researchers describing adaptation from the population ecology perspective. Aldrich has described the central processes in adaptation as variation, selection, and retention (1979). The process of *variation* creates differences among firms in a given population. These differences may be caused by either rational adaptation or simply by random chance. The process of *selection* takes advantage of this variation and selects (allows to survive) organizations which have the best fit with the environment. Finally, *retention* allows the firms that have survived the process of selection to continue to survive until the environment changes and the next round of adaptation begins.

Research which is based on a population ecology perspective focuses on populations of firms (rather than individual firms) and examines survival rather

than effectiveness or profitability (Hannan & Freeman, 1989). The population ecology view of adaptation contends that the new forms of organizations which appear are not related to changes in existing firms (firm adaptation) but rather to the entry of new firms into a population which bring much needed variation.

While I recognize the contributions made by population ecologists to the discussion of organizations, the population ecology view of adaptation was not influential in the development of this dissertation. The deterministic nature of this theory and its focus on populations rather than individual firms eliminates research questions which I feel are particularly important and interesting with regard to interorganizational change. In population ecology, top managers are given little or no credit for making intelligent decisions with regard to structural choices or the selection of competitive environments. The basic research design and hypotheses in this dissertation assume an important role for top managers and their perceptions. Rather than contemplating managers as initiators of random change, this dissertation adopts a strategic choice perspective and makes voluntaristic assumptions regarding the abilities of managers to perceive the environment and make organizational and interorganizational adjustments to create fit between the firm and the environment.

STRATEGIC CHOICE THEORY

The strategic choice view of adaptation shifts the emphasis of researchers to individual managers, their interaction, social constructions, and free will or choice. Given this perspective, individual organizations are able to adapt and

managers serve a proactive role in that they are able to change or even enact the environment in which their organization operates (Astley & Van de Ven, 1983). Over the past decade, many researchers have described strategic choice as a transformational process where organizations adapt to changes in the environment by re-forming and re-structuring themselves in an intentional and rational way (Sharfman & Dean, 1997; Zajac & Kratz, 1993; Fombrun & Ginsberg, 1990; Zajac & Shortell, 1989; Ginsberg, 1988).

John Child and Strategic Choice

The strategic choice perspective was articulated in John Child's seminal article (1972) in which he argued that organizational structure is partly determined by contingencies but also by managerial choices and that if an organization's structure is not adapted to the environment, costs tend to rise, opportunities are lost, and the organization's viability is threatened. Child argued that there is a considerable amount of managerial discretion or latitude in the choice of organizational structure. The strategic choice view holds that key decision makers in organizations could select the environment in which the firm operates, the measures of effectiveness by which the firm will judge success, and the design of the organization itself. In simplistic terms, the strategic choice view stresses the selection of the environment while more deterministic views focus on environmental selection (Child, 1997).

Child's 1972 article and the resulting "re-orientation of organizational analysis" led to debate in three important issues including the role of agency and

choice in organizational analyses, the nature of the organizational environment, and the relationship between organizational agents and the environment (Child, 1997: 43).

Parallels in Strategic Management

It is important to note that during approximately the same time period as Child wrote of the strategic choice perspective in the field of sociology, Kenneth Andrews, a professor at the Harvard Business School, captured the essence Harvard's long-standing approach to business policy and strategy in The Concept of Corporate Strategy (1971). This approach to understanding the role of top managers clearly made the same types of assumptions as Child's strategic choice perspective.

In designating what Mintzberg would later label as the "design school" (1990) in strategic management, Andrews described the foundations of the emerging field of strategic management. In the classic Harvard tradition, the primary role of top managers was to scan their environment for opportunities and threats and study the firm looking for strengths and weaknesses. Their task was then to develop and implement strategies which created fit between the firm and its environment. These strategies might include changes in the organization, the selection of its competitive environment, or both. (Andrews, 1971). The key assumption of this seminal approach to strategic management was that the best managers would correctly perceive opportunities and threats from the environment and develop strategies which selected the most favorable

environment. These managers would align the internal firm with the selected environment would enjoy success and profitability.

The Argument for Structural Choice

Bourgeois (1984) advanced the argument for structural choice into the domain of strategic management. This extended view of strategic choice contends that top managers have a high degree of latitude in the choices they make. The strategic choice view also holds that the latitude and types of choices that managers may make are enabled and constrained by managerial beliefs and perceptions as well as contingencies (Anderson & Paine, 1975; Bourgeois, 1984).

In strategic choice theory, managerial perception, cognition, and ideology play an important role in how managers guide their organizations. Some theorists feel that managers can exercise almost free will with regard to the direction of their organizations (Whittington, 1988) while others recognize some element of determinism by the organizational environment and other contingency factors (Child, 1972; Bourgeois, 1984). Both internal and external constraints on strategic choice have been developed (Whittington, 1988). The degree to which these constraints exists has been labeled "action determinism" and "environmental determinism" (Elster, 1984; Wittington, 1988: 524).

Constraints on Strategic Choice

Action determinism refers to preferences and information processing approaches favored by top managers or key decision makers. Action determinism

focuses on the importance of managerial mind-sets and managerial interpretation and analysis in the exercise or constraint of strategic choice. In the last decade, important research into managerial cognition (Huff, 1990; Stubbart, 1989; Spender, 1989) has been helpful in developing ways of understanding how strategic choice is enabled or constrained. Managers may have similar decision rules or recipes for making strategic choices (Spender, 1989). Basic managerial beliefs or mind-sets tend to constrain the strategic choice of managers towards stability or maintenance of the status quo which makes them unable to make fundamental changes in response to environmental stimuli.

Action determinism may be caused by what Dutton (1993: 340) has called automatic strategic issue diagnosis. In strategic issue diagnosis, when managers are confronted by a strategic choice, they activate classification tools or decision heuristics that they have used successfully in the past. Dutton also highlights the importance of organizational political processes in maintaining a certain approach to strategic issue diagnoses (1993). Top management team demographics have also been shown to influence the extent to which firms make adjustments and strategic change (Wiersema & Bantel, 1992). The age and education level of top managers have been shown to affect action determinism in that younger, more highly dedicated executives are more aware of, or seek out, a wider range of organizational adjustments or strategic changes than older, less educated executives (Wiersema & Bantel, 1992; Streufert & Swezey, 1986).

Perhaps the greatest contribution made by action determinism to the discussion about strategic choice is that it focuses our attention on key

characteristics of managers that may enable or constrain managerial adjustments "even in the absence of external constraints" (Child, 1997). This compliments Child's earlier focus on the influence of internal political constraints which limited the strategic choice of firm managers (Child, 1972) and other limitations to the latitude of strategic choice managers enjoy such as the bounded rationality of managers (March & Simon, 1958), and the costs and the limitations of information processing or perfect information (Cyert & March, 1963).

Synthesizing Deterministic and Voluntaristic Views of Adaptation

In trying to synthesize or integrate the deterministic views of adaptation inherent in contingency theory and the voluntaristic assumptions of strategic choice, Hrebiniak & Joyce (1985) stated that these views were at either end of a continuum and that both views were important in accurately describing organizational adaptation. They created four quadrants into which organizations were believed to fall. These four quadrants included natural selection (low choice, high determinism), differentiation (high choice, high determinism), strategic choice (high choice, low determinism), and undifferentiated choice (low choice, low determinism). Two empirical studies have tested this theory with different results. The first (Lawless & Finch, 1989) used cluster analysis techniques and found little support for the framework. A second study by Marlin, Lamont, and Hoffman (1994) claimed to correct methodological problems they felt existed in the Lawless & Finch study and found support for many of the propositions from the work of Hrebiniak and Joyce (1985).

Environmental determinism focuses on the environmental threats and opportunities which shape change related decisions made by top management (Andrews, 1971). While managers choose whether or not to compete in a certain environment, their ability to control that environment may be limited or non-existent. In his original description and recent extension of the strategic choice view of adaptation, Child describes managerial discretion about which environments to enter or make relevant (Child, 1972; Child, 1997). Once an environment is selected, "conditions of an environment assume objective properties which are consequential for an organization, however much they are filtered by subjective interpretation or negotiated through interaction between internal and external actors" (Child, 1997: 53).

Increasing Importance for Interorganizational Relationships

In the earliest constructions of the strategic choice view, the external environment primarily consisted of economic factors such as supply and demand and the rate of technological change. The external environment could easily be distinguished from the organizations which had selected them (Child, 1997). However, the rapid growth and increasingly complex interorganizational relationships which have developed over the past decade have challenged earlier definitions of the enviornment. As Child's summarizes this issue (1997: 54):

> "The growth of organizational networks and collaborative arrangements between organizations shows that is not necessarily meaningful to look for clear and fixed boundaries to organizations. Rather, what used to be called boundary relationships are now often conducted through sets of arrangements which are

> themselves organized. An appropriate contemporary extension of strategic choice analysis would take this into account. It would continue, on the one hand, to maintain that environments have properties which simply cannot be enacted by organizational actors. This poses to those actors the question of whether they can select the most attractive environment in which to operate. However, it would recognize, on the other hand, that the implications of some environmental properties may be negotiable with social interaction between organizational actors and their external contacts. Attention to the ways in which actors seek to realize their goals through selection between environments needs to be complimented by attention to ways they may seek to attain their objectives through mutual accommodation and collaboration with the parties within an existing environment."

This notion of interorganizational environments is growing in importance and relevance in both the field of strategic management and organizational theory. The concepts of interorganizational adjustment and interorganizational strategies play a central role in this dissertation. While Child (1997) refers to both informal social relationships explored in social network theory and formal organizational relationships typically discussed in the organizational theory and strategic management literature, this dissertation has a clear focus on the latter (formal) relationships.

CONFIGURATION THEORY

Theories of organizational configurations or archetypes have their theoretical roots in the structural contingency, strategic choice, and business policy & strategy literature streams (Miller, 1986). Configurations are a natural extension of the work done by the structural contingency theorists described earlier in this chapter such as Burns and Stalker (1961), Woodward (1965), and

Lawrence & Lorsch (1967). These theorists isolated ideal organizational types and related them to the environment. Configurations of strategy and structure have also been of importance since the inception of the field of strategic management. The basic relationship between strategy and structure was first discussed by Chandler (1962) and then confirmed by subsequent studies (Pooley-Dias, 1972; Channon, 1973). Richard Rumelt showed that when strategy and structure matched (were in proper configurations) firms had superior performance (1974).

While some researchers are critical of the configurational approach (Donaldson, 1996) many theorists embrace configurational approaches in analyzing organizations and their ability to adapt and perform effectively (Miller 1996; Meyer, Tsui & Hinings, 1993; Doty, Glick & Huber, 1993).

Early Works on Configuration

The movement to research multi-dimensional configurations was led by Miller and Friesen (1977, 1978) and Miles and Snow (1978). In the theoretical discussion about configuration, researchers propose the organizations tend to change many of their elements in order to respond to environmental change and be adaptive. Structures, strategies and other organizational and managerial characteristics are bound together in configurations and certain configurations tend to be more adaptive than others. These most adaptive configurations are often referred to as ideal types and firms which look the most like these

configurations are expected to enjoy superior adaptive capabilities and better fit with the environment.

Miller and Friesen: Toward a Holistic Approach

Miller and Friesen (1978) highlighted the limitations of the structural contingency theorists' approach of examining bivariate relationships one at a time. They suggested a more "holistic approach" (Miller & Friesen, 1978: 921) in order to discover the most common combinations or organizational strategies, structures and environments. The goal of their research was to discover the successful and unsuccessful combinations of variables. They examined eight-one firms described in Fortune Magazine articles and in the Harvard Case Clearing House. Using these sources, they developed an empirical taxonomy of organizations based on these characteristics or variables. They found six configurations or archetypes which were successful and four which were unsuccessful. Successful archetypes used a number of adaptive mechanisms and behaviors to be successful while unsuccessful firms demonstrated distinct "problems or pathologies" in dealing with the environment (Miller & Friesen, 1978: 932).

Miles & Snow's Strategic Typology

Miles & Snow (1978) developed a typology of strategic typologies which divided organizations into prospector, analyzer, defender, and reactor ideal types. In their typology, Miles & Snow described organizational strategies as having

three primary domains: the entrepreneurial (how the organization orients itself to the market), the administrative (how the firm coordinates its activities and implements its strategy), and the technical (how the organization produces products or services). Prospector firms frequently change products or add new products or services. They stress innovation and flexibility in order to respond rapidly to changes in the market place. Analyzer firms maintain a stable set of products and services and are very selective with regard to the new markets they enter. These firms allow others to be first to market and then follow if results are promising. They emphasize formal planning and balance cost containment and costly efforts related to innovation. Defender firms offer a stable set of products and services to well defined markets and typically have strict cost control systems and consistently seek operating efficiencies in order to lower costs. Reactor firms do not have a consistent set of strategies and behaviors. They exhibit characteristics of the other three viable strategic types.

The Miles and Snow strategic typology has been researched extensively in a wide variety of organizations and industries and has been relatively well supported in these studies. Snow and Hrebinak (1980) found that reactors performed worse than prospectors, analyzers, or defenders; Hambrick (1983) found that defenders consistently outperformed prospectors in profitability but that prospectors gained more market share than defenders in innovative industries; Zajac and Shortell (1989) found that prospector and analyzer firms performed better than defenders in the hospital industry; Shortell, Morrison and Friedman (1990) had similar results in a broader study of the health care industry.

Recently, Miles, Miles, and Snow (1996) have extended this strategic typology into a "good for practice" theory of organizational forms. Functional, divisional, matrix, network, and cellular forms are described as ideal types and a useful in describing organizational pathologies which typically result in poor performance.

Configurational Assumptions

An important assumption in most configurational approaches is that managers have the latitude to change their organizations in order to move them closer to ideal types or away from pathological or nonviable configurations. This assumption aligns most of configurational theory with the voluntaristic assumptions of the strategic choice perspective. Another important concept in configurational approaches to adaptation is equi-finality (Doty, Glick & Huber, 1993). With an assumption of equi-finality, firms in various configurations can do equally as well if they approximate the ideal types of configurations.

RENEWAL, CONTINUOUS CHANGE AND COMPLEXITY THEORY

Recently, important extensions of adaptation theory have been made within the context of evolving theories of organizational change. The study of strategic responses of firms based on the shifting demands of the enviornment and emerging theoretical links between continuous change and competitive advantage have their intellectual roots in complexity theory. Continuous change and adjustment are increasingly being cited as key competitive competencies for

organizations in highly uncertain industries and environments. These views adopt assumptions which basically conform to those described in strategic choice descriptions of adaptation.

Strategic Renewal

In the early 1990s, the strategic management literature began to investigate strategic renewal as a way that firms could continuously adjust strategically in order to maintain or improve the alignment between the internal organization and the external demands of the environment. A key point made in describing adaptation as strategic renewal is that redirection of the firm occurs in an evolutionary way and the need for renewal is never-ending (Meyer, Brooks, & Goes, 1990; Huff, Huff, & Thomas, 1992). The strategic renewal model stresses the interplay of inertia (the current way a firm operates and the institutional forces and commitments which enforce the status quo) and stress (the mismatch between opportunities and threats facing the firm and its organizational ability to address them) (Huff, Huff, & Thomas, 1992).

Research in strategic renewal is currently assessing how and why some organizations are able to overcome inertial and relieve stress. For example, a recent study by Barr & Huff (1997) stressed strategic renewal efforts typically do not take place unless there are direct links between environmental change and firm performance. Barr and Huff also find that different managerial beliefs about causality provide a plausible explanation for why some firms are able to initiate strategic change and other firms are not (1997).

Complexity Theory, Continuous Change and Competitive Advantage

The notion of never-ending change has been broadened to include all organizational adjustments rather than only strategic renewal. In making the argument for continuous change, there have been challenges to the key assumption in both the deterministic and voluntaristic views of adaptation that successful systems (organizations in voluntaristic models and populations in more deterministic models) move toward predictable and stable states of adaptation to the environment through negative feedback processes (Stacey, 1995). In both of these models success is assumed to be consistent movement toward equilibrium, stability and predictability. The "science of complexity" has been introduced as an alternative model of organizational change which is based on non-linear network feedback systems and their dynamic properties (Gleick, 1987; Levy, 1994; Stacey, 1995).

Stacey has described the emergence of a new model of complex adaptive systems that pulls together a number of important ideas from other academic domains which in the past have not been related to organizational change, particularly strategic change (1995). The development of this new model was motivated by research that found in order for firms to be truly innovative and creative, they had to operate in a constant state of disequalibrium where they are driven by both positive and negative feedback systems.

The study of complex adaptive systems through the lens of chaos theory and the science of complexity is at a nascent stage. However, there are three key

issues associated with organizational change and adjustment from this perspective (Stacey, 1995: 490):

> Systemic properties are studied by focusing on firms that are operating far from the point of equilibrium. Informal, self-organizing networks are the nexus of chaotic behavior, the "engines of inquiry," and exhibit both stability and instability at the same time.
>
> It is considered that while the system may be deterministic regarding structure, it is voluntaristic with regard to outcome. There is not considered to be a point of equilibrium. The important constraints on strategic choice come from the self-organizing structures individuals establish.
>
> Self organizing network activities are stimulated by disorder, conflict, and disagreement within the system rather than orderly activities and the movement toward equilibrium. Outcomes from these processes tend to be emergent rather than planned.

Brown & Eisenhardt (1997) have most recently used complexity theory to advocate continuous change strategies in hypercompetitive environments where the ability to continuously change and adapt are crucial for organizational survival (Eisenhardt, 1989; D'Aveni, 1994). They challenge the punctuated equilibrium model of organizational change which assumes that firms go through long periods of incremental change and occasional, brief periods of discontinuous or radical change (Tushman & Anderson, 1986; Utterback, 1994; Rosenkopf & Tushman, 1995). In the punctuated equilibrium model, there is the implicit assumption that short bursts of radical change make fundamental differences in industries and the companies which comprise them (Gersick, 1991).

Brown and Eisenhardt cite numerous examples of firms which "compete by changing continuously" (1997: 1) including Intel, Wal-Mart, 3M, Hewlett-

Packard, and Gillette. Brown and Eisenhardt describe the ability of these firms to change or adjust continuously and rapidly as a core competence at the heart of the corporate culture (1997). The implications of continuous change have been investigated in several notable cases such as pricing and route changes within the airline industry (Miller & Chen, 1994), charter shifts in the electronics industry (Galunic & Eisenhardt, 1996), in market driven moves and competitive countermoves (D'Aveni, 1994; Eisenhardt & Tabrizi, 1995), and in product innovations (Burgelman, 1991; Chakravarthy, 1997). In these research efforts, continuous change (implying high levels of organizational and interorganizational adjustment) is viewed as integral to organization success and survivability.

DESCRIBING THE PROCESS OF ADAPTATION

The actual process of organizational adaptation is described in a number of ways in the academic literature. Each description adds richness to the discussion of how organizations make adjustments in response to the environment.

Adaptation Archetypes

Miller and Friesen (1980) focus on recurring patterns of adaptation and develop archetypes which are useful in characterizing adaptation. Their studies explored environmental (turbulence, heterogeneity), structural (centralization), and strategy making (intelligence and rationality) variables and their relationship to adaptation. Miller and Friesen (1980) also found that organizational momentum was the most critical factor in adaptation and that firms that reverse

their direction or mode of adaptation are quite rare. This momentum results from established organizational routines, structures, political coalitions, and heuristics. Miler and Friesen (1980) found that adaptation was characterized by dramatic periods of revolutionary change in which the firm changed its direction in strategy and structure variables.

States of Adaptation

Chakravarthy (1982) proposed an innovative model to help make sense of adaptation. Chakravarthy identified states of adaptation (unstable, neutral, and stable), the process of adaptation (adaptive specialization and adaptive generalization), and adaptive ability (determined by organizational capability and material capability). Chakravarthy hypothesized that firms with specific strategy and structure alignments would have better performance. This hypothesis had its roots in Chandler's (1962) seminal work in strategy and structure. The model was based on the earlier writers of contingency theory research (Scott, 1987) who described organizational effectiveness as a function of fit between the internal processes of an organization and its environment (Burns & Stalker, 1961; Lawrence & Lorsch, 1969; Hage & Aiken, 1970).

Jennings and Seaman (1994) used this model as the foundation of their empirical research which concluded that firms with an optimum combination of strategy and structure tend to have superior financial performance.

Environmental Jolts

Unanticipated and unprecedented events in the environment offer a unique opportunity to examine the response of firms an they try to adapt. These sudden changes or "environmental jolts" (Meyer, 1982: 515) seldom cause the collapse of a firm but can indicate the overall ability of a firm to adapt to its environment. In the context of a larger study of health care industry relationships, Meyer (1982) studied the organizational impact of an anesthesiologists' strike in 1975 in the San Francisco area. In discussing the impact of environmental jolts on organizations, Meyer (1982) developed a three-phase model of adaptation which included an anticipatory phase, a responsive phase, and a readjustment phase. He found that ideological and strategic variables could better predict organizational perceptions, responses, and consequences than structural variables in his model or organizational slack (Meyer, 1982).

Several years later, Tushman and Romanelli (1985) proposed a model of punctuated equilibrium for organizations. This model suggests that organizations evolve through long, relatively stable periods of relatively minor change or symbolic actions by top managers. Convergent periods are punctuated by brief periods of dramatic, discontinuous change (reorientation periods) in which firms change strategy, power relationships, and organizational structure. These changes set the foundations for the subsequent period of convergence.

Adaptive Response and Organizational Adjustment

Koberg (1987) explored the process of adaptive responses made by firms based on earlier work in organizational theory by Miles (1975). Her work established a hierarchy of adaptive organizational response (procedural change, personnel change, process change, structural change, and strategic change) based on Hrebiniak and Joyce's (1984) principle of minimum intervention. Her study also found that environmental uncertainty and the scarcity of resources were related to the level of a firm's adaptive response. Koberg's work provides a foundation for this dissertation and is discussed in greater detail in Chapter III.

Levels of Analysis

Another significant contribution to the adaptation literature was the development of a two distinct levels of analysis for change. Meyer, Brooks, and Goes (1990) developed a model of change at the organizational and industry levels. They characterized organizational change as either adaptation or metamorphosis and industry level change as evolution and revolution. They identified a gap in the research regarding discontinuous change in industries or evolution. In their four quadrant model, Meyer, Brooks & Goes highlight incrementalism and resource dependence theory as particularly important in the study of first order organizational change in evolutionary environments. They draw upon population ecology and institutional theories to study first order change in an industry. For firm level second order change, they find configuration analysis as most useful and for second order industry level change, they prefer

theories of punctuated equilibrium (Haveman, et al, 1993). While their article focuses primarily on industry level change and narrowly defines adaptation as first order change in slowly evolving environments, it is an important study in the field and in the on-going examination of change in the hospital industry.

Passive and Opportunistic Models of Adaptation

Miller, Lant, Milliken and Korn (1996) related the simplicity or complexity of an organization's strategic actions by developing two models of organizational adaptation. This study reiterated the importance of the environment in explaining the adaptive actions of organizations. The authors also developed two models of organizational adaptation, the passive model and the opportunistic model, and relates them to strategic simplicity (1996).

In the passive model, organizations which faced relatively stable environments with few threats were believed to typically have very narrow "strategic repertoires" and would tend to follow relatively simple, narrow strategies (Miller, 1996: 865). Organizational routines would tend to become fixed and while managers would make some minor refinements in organizational strategies, there would be little major change. Adaptation and organizational change were only expected to take place when managers perceived threats in the environment or the organization had begun to experience problems such as decreased performance or effectiveness.

In contrast, the opportunistic model of adaptation proposed that organizational adjustments were driven by a constant search for opportunities in

an environment perceived by managers to be rapidly changing. The model postulated that these organizations would develop and employ a wide variety of strategic actions and would tend to discourage the establishment of routines and would seek to reward innovative behavior and experimentation by members of the organization. In a word, the firms involved in the opportunistic model of adaptation would be more entrepreneurial. The only limit placed on the strategic repertoires of these organizations tended to be the amount of slack resources available to the firm (Miller, et al., 1996: 867).

Miller, Lant, Milliken and Korn empirically tested these models in the stable furniture industry and the turbulent computer software industry (1996). They found general support for their model. Firms in the stable furniture industry tended to follow simple strategies and engage in less adaptation. Strategic simplicity was negatively associated with managerial perceptions of threats and positively associated with slack resources which were operationalized as financial liquidity. In contrast, firms in the extremely turbulent computer software industry had more complex and ever-expanding strategic repertoires. Interestingly, in both the stable and passive industries studied, strategic simplicity was found to be related to an increasing return on assets (Miller, et al., 1996).

THEORETIC APPROACH IN THIS DISSERTATION

This dissertation theoretically develops and empirically tests ideas about interorganizational adjustment and adaptation, interorganizational strategies, and firm performance. It does so primarily from the strategic choice perspective with

voluntaristic assumptions about managers and their ability to initiate organizational and interorganizational change. While both strategic choice and deterministic views are potentially valuable in understanding adaptation (Hrebiniak & Joyce, 1985), the propositions and hypotheses in the following chapter are derived primarily from the organizational theory and strategic management literature emphasizing the process of organizational and interorganizational adaptation and the analysis of organizational configurations. Also, the organization communication literature is used to develop hypotheses related to control and adjustment.

An important aspect of this dissertation is its focus on the interorganizational adjustments of firms. As suggested by Child (1997), this study separates interorganizational adjustments and strategies from the environment instead of treating them as part of the firm's external environment. Much of the organizational theory and strategic management literature focuses on either the organization/firm level (micro) of analysis or the population/industry level (macro) of analysis. The interorganizational level has been largely ignored, to the detriment of the field.

In the area of organizational behavior, House, Rousseau, & Hunt (1995) have argued that the study of individuals (the micro view) and the study of organizations (the macro view) need to be supplemented by the study of groups or teams (the meso view). A similar argument may be made that in the area of organizational theory and strategic management. The study of interorganizational

relationships and adjustments injects a meso view which has great potential benefits for this areas of academic inquiry.

The approach adopted in studying interorganizational adjustments and strategies in this dissertation is aligned much more closely with organizational or firm level studies than with population or industry level analyses. However, by separating interorganizational relationships and adjustments from the greater environment, this dissertation seeks to make a contribution toward understanding the meso level of interactions between organizations and highlight the potential contribution that future meso level studies may make in the fields of organizational behavior and strategic management.

CHAPTER III

DEVELOPMENT OF RESEARCH HYPOTHESES

INTRODUCTION

This chapter provides a detailed theoretical development of the dissertation model of adaptive interorganizational adjustment introduced in Chapter I and derives this study's research hypotheses. It proposes that a hierarchy of interorganizational adjustments exists and that there is a relationship between organizational adjustment and interorganizational adjustment. The concept of interorganizational adaptation or adjustment is related to environmental, organizational, and managerial characteristics in three multi-part hypotheses.

Two broad classifications of interorganizational strategy are developed and related to the level of interorganizational adjustment and two additional hypotheses involving Miles and Snow's (1986) dynamic network characteristics are proposed. Finally, the possible relationship between interorganizational adjustment and firm performance is explored in two hypotheses.

PRINCIPLE OF MINIMUM INTERVENTION

There is general agreement among organizational theorists (Chandler, 1962, Lawrence & Lorsch, 1967; Galbraith, 1973, Tompson, 1967) that managers who are acting intentionally will implement strategies and make adjustments

which pose the least serious economic costs and interruptions for their organizations (Hrebiniak & Joyce, 1984). Chandler argues that organizations should not change their strategies until forced to do so by inefficiencies and that managers should make the minimum changes needed in order to make the organization operate efficiently (1962). Galbraith argues that complex information processing techniques should be used only after more basic structures have been overloaded (1973).

Organizational adjustments also affect members of the organization by impacting the way they accomplish their tasks and integrate work with their normal lives (Harrison, 1970). This gives managers a "humanistic" reason as well as an economic reason to limit the scale and scope of adjustments to a minimum (Hrebiniak & Joyce, 1984).

These arguments are summarized by Hrebiniak & Joyce (1984: 9) into their principle of minimum intervention in which they state: "In implementing strategy, managers should change only what is necessary and sufficient to produce an enduring solution to the strategic problem being addressed." When this principle is violated, organizations may engage in unnecessary adjustments and be forced to absorb the financial and human costs of excess intervention.

It is also possible to extend this concept to recent arguments for continuous change (Brown & Eisenhardt, 1997). While fit is not emphasized in this notion of strategic change, it is anticipated that top managers who make many improvisational adjustments may tolerate error and inefficiency but they will still

implement those changes in accordance with the principle of minimum intervention.

A Hierarchy of Organizational Adjustments

Koberg empirically tested the principle of minimum intervention and found general support with regard to organizational adjustments. Using an instrument developed by Ungson & Schwab (1980) which was based on the work of Miles (1975), she asked managers to indicate how often they made the following types of organizational adjustments: procedural (changes in rules and work procedures), personnel-related (hiring and firing of employees), process (changes in budget allocations), structural (creation or elimination of departments), strategic (changes in product or the market served). Koberg's study found that the less costly and less invasive adjustments were made significantly more than the more expensive and disruptive adjustments. These findings supported Hrebiniak & Joyce's (1984) principle of minimum intervention.

Koberg's study made an interesting contribution to the literature on organizational adaptation. However, her study did not examine interorganizational adjustments. Since interorganizational relationships have become more important to managers and more interesting to researchers, it is important to know how interorganizational adjustments are employed by organizations. The development of a "hierarchy of interorganizational adjustments" makes a significant contribution to the literature on organizational change and adaptation.

A Hierarchy of Interorganizational Adjustments

Just as managers initiate organizational adjustments in order to implement firm strategies or adapt to the environment (Miles, 1975; Koberg, 1987), managers also initiate adaptive interorganizational adjustments in order to create better alignment with the environment or to pursue strategies of continuous change. There are a wide variety of interorganizational adjustments and taxonomies of interorganizational arrangements described by researchers (Root, 1988). Typically, most descriptions of relationships between organizations range along a spectrum of vertical integration, interdependence, hierarchical governance structures, or "from markets to hierarchies" (Williamson, 1975; Thorelli, 1986; Lorange & Roos, 1992; Powell, 1990; Ring & Van De Ven, 1992).

At one end of this spectrum, interorganizational interactions and transactions are market-like. In the market, firms use delivery orders, purchase agreements, or formal contracts in order to obtain needed goods or services from firms offering the best value. These market based relationships last only as long as the current transaction and interaction between firms is minimal (Williamson, 1975; Powell, 1990). There is virtually no vertical integration involved in these relationships (Lorange & Roos, 1992) and firms act independently (except for the terms of the contract or agreement).

At the other end of the spectrum are hierarchical adjustments in which an organization vertically integrates all of its activities and acquires products, services, or abilities that it does not all ready possess through merger and

acquisition activity (Powell, 1990). In this extreme case, the only interaction between organizations is their combination. This is a hierarchical and acquisitive approach to interorganizational relationships. In effect, this extreme approach eliminates the need for interorganizational arrangements.

Between markets (vendor and supplier adjustments) and hierarchies (mergers and acquisitions which are not considered to be interorganizational in this study) lie the interactions or adjustments that are of most interest to researchers in organizational theory and strategic management (Thorelli, 1986; Miles & Snow, 1986; Powell, 1990). Interorganizational relationships and adjustments which are not hierarchical or market-like have been identified as particularly important in discussing strategic relationships (Lorange & Roos, 1992; Yoshino & Rangan, 1995).

Located near the hierarchy end of the spectrum are adjustments to shared equity arrangements such as joint venture initiations or discontinuations and adjustments in existing joint ventures (Perlmutter & Hennan, 1986; Yoshino & Rangan, 1995). Further from hierarchies are nontraditional contract adjustments which involve major changes in cooperative agreements with other firms concerning the marketing, distribution, or production of their products or services (Porter & Fuller, 1986; Yoshino & Rangan, 1995). Closest to market relationships on the spectrum of interorganizational adjustments are changes in short term relationships or alliances and recurrent contracts which include initiations, discontinuations, or changes in important terms or conditions of those

arrangements (Yoshino & Rangan, 1995, Powell, 1992; Jarillo, 1988; Thorelli, 1986; Miles & Snow, 1986).

Given that there are a number of distinct types of interorganizational relationships and interorganizational adjustments associated with those relationships, the following hypothesis is consistent with the principle of minimum intervention and the notion of adaptive interorganizational adjustments:

> *Hypothesis 1a: There is a hierarchy of interorganizational adjustments that can be arranged in ascending order of cost and scope -- vendor and supplier adjustments; adjustments to short term alliances; cooperative marketing, distribution, or production adjustments; licensing and equity investment adjustments; and joint venture adjustments.*

Relating the Level of Organizational and Interorganizational Adjustments

Given a strategic choice perspective on adaptation change and strategy implementation, managers are expected to adjust both internal organizational activities as well as relationships with other organizations. Managers typically make organizational and interorganizational adjustments in order to enhance firm adaptation and to bring the organization into alignment with its environment (Lawrence & Dyer, 1983; Nohira, 1992; Koberg, Chesley & Heppard, 1995). Therefore, it is expected that managers who initiate a high level of organizational adjustment are expected to initiate a high level of interorganizational adjustment leading to the following hypothesis:

Hypothesis 1b: There will be a positive association between the level of organizational adjustments made by a firm and the level of interorganizational adjustments made by the firm.

THE ENVIRONMENT AND ADAPTATION

The environment is defined by Duncan (1972) as factors outside the formal boundary of the firm which may be either physical or social and are taken into account by top managing when making organizational decisions. The environments in which organizations compete or might compete today seem to be constantly changing. In order to maintain acceptable levels of performance and organizational effectiveness, top managers must recognize the changes that are occurring and initiate adjustments when necessary (Weick, 1987). One of the central tenants in strategic management is that top managers must find a match between threats and opportunities in the environment and strengths and weaknesses within the organization (Andrews, 1971).

The Critical Role of Top Managers

When top managers fail to recognize important changes in the environment or respond to them appropriately, there is misfit with the environment and poor performance or serious organizational problems (Dunbar & Goldberg, 1978). The growing body of research supports the belief that top managers have critical role in initiating organizational and interorganizational changes that will result in fit between the organization and its environment

(Wiersema & Bantel, 1993). Romanelli and Tushman (1988:130) have highlighted the importance of top managers in initiating and monitoring organizational and interorganizational adjustments in response to environmental change as follows:

> "Where environments are changing and/or performance outcomes are low or declining, leadership's primary task is to intervene on ongoing patterns of commitment and exchange to redirect the character of an organization's relationship with the environment."

Characterizing the Competitive Environment

Most researchers characterize the external organizational from either an the resource dependence perspective (Pfeffer & Salancik, 1978) or the information processing perspective (Daft & Weick, 1984). The resource dependence perspective contends that the external environment contains organizations which have or produce resources that the firm must acquire in order to survive (Pfeffer & Salancik, 1978). This dependence on external firms and their resources leads to external control from the organizations upon which the firm depends for its resources (Pfeffer & Salancik, 1978). The availability and access to critical resources, often referred to as organizational munificence, is important to researchers examining resource dependence.

Closely related to the resource dependence view are descriptions of the firm's external environment as a network of interorganizational relationships which control access to critical resources (Pennings, 1981; Porter, 1985). Because of this network of interdependencies, factors such as the level of

cooperation and competitiveness of interorganizational relationships are important for this research perspective (Schermerhorn, 1975).

The other primary way of characterizing the firm's external environment is the information processing perspective. This view of the external environment focuses on how the perceived environment impacts organizational processes and decision making. It emphasis that fact that organizations (and managers) "extract, process, and act on information from their environment" (Huber & Daft, 1987: 132). Organizations are envisioned and designed in order to process information effectively from the environment (Galbraith, 1973). Organizational studies have created a number of useful typologies that may be used to describe an the external environment (Emery & Trist, 1965; Terreberry, 1968; Miles, Snow & Pfeffer, 1974). Two environmental characteristics which commonly appear in these typologies and organizational studies are environmental complexity or heterogeneity and turbulence or uncertainty (Huber & Daft, 1984).

In recent years, many firms are increasingly facing highly complex and uncertain hypercompetitive environments in which there are relatively short periods of advantage for a firm and frequent disruptions (D'Aveni, 1994). These frequent disruptions appear to be the result of the globalization of markets, technological change, shorter product life cycles, and more aggressive competition (Volbera,1996). These "high-velocity" environments are particularly challenging for strategic decision makers. It has been claimed that in hypercompetitive environments, profitability is not the result of the firm's

established and unique routines, but instead arises from a firm's "adaptive capability" (Volbera, 1996).

It has been suggested that new organizational forms or special interorganizational relationships will develop in order to deal with this hypercompetitive shift in the environment (Daft & Lewin, 1993; D'Aveni, 1994; Thomas, 1996). Some of the new organizational forms identified have been the network firm (Miles & Snow, 1986; 1994) the virtual corporation (Davidow & Malone, 1992) and the shamrock organization (Handy 1990). In discussing these new organizational forms, the authors stress the importance of interorganizational relationships in shaping or rapidly adapting to the hypercompetitive environment.

Environmental Uncertainty and Interorganizational Adjustment

Perceived environmental uncertainty or turbulence refers to the rate of change in environmental factors which have a notable impact on the organization (Duncan, 1972; Sharfman & Dean, 1991). Environmental uncertainty is considered to be a perceptual phenomenon because organizations or executives can initiate organizational and interorganizational adjustments in order to adapt to the environment that they perceive (Yasai-Ardekani, 1986; Milliken, 1990). Therefore, the perception of environmental uncertainty is a product of both the environment and the manger that perceives it. Thompson has asserted that environmental uncertainty is "the fundamental problem for complex organizations and coping with uncertainty as the essence of the administrative process" (1967: 159). Environmental uncertainty has been a central variable in research

concerning adaptation, organization - environment fit, and organizational design (Burns & Stalker, 1961; Galbraith, 1973; Lawrence & Lorsch, 1967; Thompson, 1967).

In stable environments, adjustments are infrequent, established routines are maintained and learning requirements are minimal (Aldrich, 1979; Eisenhardt, 1989). In unstable environments, established routines and managerial beliefs are subject to reinterpretation and change and the level of organizational adjustment tends to be high (Duncan, 1972; Koberg, 1987). Similarly, as the competitive environment becomes increasingly turbulent, new organizational forms emerge in which interorganizational arrangements such as joint ventures, strategic alliances, subcontracting and licensing activities become very important for organizations (Miles & Snow, 1986). The structure of interorganizational relationships in these emerging organizational forms is expected to be flexible to help the organization continually adapt to the uncertain environment. Therefore it is expected that:

Hypothesis 2a: Higher levels of environmental uncertainty perceived by top managers will be associated with higher levels of interorganizational adjustments.

Environmental Heterogeneity and Interorganizational Adjustment

Environmental heterogeneity or complexity addresses numerosity, level of diversity, and interdependence of relevant actors in the firm's perceived external environment (Huber & Daft, 1987). Numerosity refers to the number of relevant actors such as competitors, suppliers, and markets with which the firm has contact

or is influenced by. Diversity refers to the number of distinctly different markets or niches served by an organization. Interdependence refers the degree to which organizations depend upon each other. Firm interdependence is believed to be increasing rapidly because of the greater specialization of firms.

In environments which are perceived to be highly heterogeneous, it is expected that firms will specialize, become more dependent on a larger number of firms, and therefore make a relatively large number of interorganizational adjustments. Firms and managers in heterogeneous environments are presented with a greater variety of choices concerning markets, competitors, suppliers, customers, and this greater variety of choice provides higher levels of adaptive latitude (Hambrick & Finkelstein, 1987). Other research also indicates a link between environmental heterogeneity and the level of organizational and interorganizational adjustment. For example, in a study of conservative business firms, Miller & Friesen (1982a) found that the more heterogeneous the environment was perceived to be by managers, the more innovative and adaptive they were. Therefore it follows that:

> *Hypothesis 2b: Higher levels of environmental heterogeneity perceived by top managers will be associated with higher levels of interorganizational adjustments.*

Environmental Munificence and Interorganizational Adjustment

Environmental munificence is the scarcity or abundance of resources needed by an organization (Castrogiovanni, 1991; Dess & Beard, 1984; Pfeffer &

Salancik, 1978). These availability of these resources affects firm growth, survival, and the ability of new firms to enter the environment (Randolph & Dess, 1984). Many researchers have argued and empirically shown that environmental munificence is an important variable in the study of organizations and adaptation (Staw & Szawajkowski, 1975; Tushman & Anderson, 1986; Yasai-Ardekani, 1989; Cameron, Kim & Whetton, 1987; Koberg, 1987). Research has also shown that environmental munificence is positively associated with the range of strategy and adaptation adjustments available to managers and organizations (Brittain & Freeman, 1980; Tushman & Anderson, 1986).

When resources are perceived as plentiful, organization survival is possible under a wider number of strategies, structures, and interorganizational arrangements (Castrogiovanni, 1991). When resources are scarce, competition increases (Yasai-Ardekani, 1989), and there is less firm profitability and organizational slack (Child, 1972; Dess, 1987). For example, Koberg (1987) found that secondary schools made more organizational adjustments including changes in budgets, planning systems, control systems, and equipment and facilities when managers or administrators perceived lower levels of environmental munificence.

With regard to interorganizational relationships, the level of adjustment has been shown to be inversely related to the perceived level of environmental munificence. In other words, managers and organizations that perceive shortages in important environmental resources may try to avoid competition or hypercompetition for these resources by cooperating or colluding with other

organizations (Aiken & Hage, 1968; Staw & Szawajkowski, 1975; Pfeffer & Salancik, 1978). For example, Aiken & Hage (1968) found that environmental munificence was inversely related to the number of joint programs among sixteen social welfare and health organizations (Castrogiovanni, 1991). Because theory predicts that firms are likely to engage in more interorganizational arrangements when environmental resources are perceived to be scarce, it is expected that there will be higher levels of interorganizational adaptation and adjustment in non-munificent environments. Therefore:

> *Hypothesis 2c: Higher levels of environmental munificence perceived by top managers will be associated with lower levels of interorganizational adjustments.*

Price Competition and Interorganizational Adjustment

Another important element in the firm's external environment is the level of price competition which the firm faces (Birnbaum, 1984; Yasai-Ardekani, 1986; Hambrick & Finkelstein, 1987). In markets which are oligopolistic, the leading firms have latitude with regard to setting the price of their product or services because there are relatively few firms with which to compete and barriers to entry may be erected to keep new entrants from increasing competition. Other non-oligopolistic firms compete in markets where products are highly differentiable and where there is little competition based on price. In these markets, firms compete on the distinctiveness and utility of their product or services rather than its price.

Pfeffer & Leblebici (1973) found that organizations tended to make fewer adjustments and that managers had less range in their discretion when they competed based on the price of their products or services. Birnbaum's study (1984) found that firms competing in the medical diagnosis and medical therapy market faced high levels of competitive pricing and that this increased competition based on price had a greater impact top managers and their selection of adaptive strategies than did pressure from customers or regulators. Hambrick and Finkelstein (1987) have also described lower levels of executive discretion and adaptive latitude in firms that produced products or services that were not easily differentiable. They hypothesized that managers in commodity markets would have less discretion and make fewer adjustments than managers in markets where price competition was less intense. Therefore it is expected that:

> *Hypothesis 2d: Higher levels of price competition perceived by top managers will be associated with lower levels of interorganizational adjustments.*

THE ORGANIZATION AND ADAPTATION

Contingency, strategic choice, and strategic management theorists investigating firm adaptation and adjustment have long recognized the influence of organizational characteristics on the organization's ability to adapt (Burns & Stalker, 1961; Lawrence & Lorsch, 1967; Thompson, 1967; Andrews, 1971). In their discussion of the history of adaptation in seven industries, Lawrence and Dyer described an interaction between the form or structure of an organization

and the environment which affected the degree of adaptation attained (1983). Organizational structure was found to assist or block firm adaptations. More organic structures have been found to be more adaptive in uncertain or turbulent environments than mechanistic structures (Burns & Stalker, 1961; Miller & Friesen, 1982b; Koberg, 1987).

While organizational adaptation research has most commonly studied the characteristics of strategy and structure in relation to the environment and each other, the relationship between many elements of the organization have been related to adaptation. For example, configuration researchers assert that the environment and several characteristics of the environment interact to form highly adaptive configurations or archetypes (Miles & Snow, 1978; Miller & Friesen, 1982a; Miller, 1986). Several key organizational elements typically found in these configurations may be related to interorganizational adaptation or adjustment below.

Centralization and Interorganizational Adjustment

One of the most frequently discussed elements of the organization in the context of adaptation is centralization. Centralization refers to the hierarchical level of managers or workers in the organization that have the authority to make decisions. When top managers retain all decision making authority, the organization is said to be highly centralized. When the authority to make organizational decisions is delegated to managers and employees at lower organizational levels, the firm is considered to be decentralized (Daft, 1989).

Top managers in centralized organizations typically have greater latitude in controlling organizational adaptation and adjustment and can keep the organization focused on a clear strategy and its goals (Fredrickson, 1986; Hambrick & Finkelstein, 1987). In decentralized organizations, researchers have asserted that there will be greater flexibility because lower level managers are able to make adjustments without the approval of top management (Mintzberg, 1979; Jones, 1995) however empirical research to date has not shown a clear relationship between centralization and the level of organizational adjustment (Koberg, 1987). Adjustments and adaptation are also believed to occur more quickly because high levels of intraorganizational coordination are not required in decentralized organizations (Eisenhardt, 1989) or in organizations where decision making is, at least, integrated (Eisenhardt, 1990).

New organizational forms are expected to have especially high levels of decentralization in order to maintain the flexibility and innovative behavior demanded by the environment (Davidow & Malone, 1992; Miles, Miles & Snow, 1996). In discussing how firms can make a "transition to agility," Goldman, Nagel, & Preiss suggests that firms leverage human resources through teaming and employee empowerment and by flattening the managerial hierarchy and decentralizing decision making (1995: 177).

In most discussions of new organizational forms, interorganizational relationships are stressed for adaptation, innovation and learning. Subcontracting and vertical disaggregation are believed to be very closely related to decentralization in new organizational forms. In firms where high levels of

interorganizational contact and adjustment are required, decentralized decision making, much of it done in teams, has been advocated by many researchers (Miles & Snow, 1994). Chesbrough & Teece (1996) suggest that the level of centralization is typically low in organizations with high levels of interorganizational relationships such as virtual companies (market-like interorganizational relationships), alliances, and joint ventures while the level of centralization is typically high in divisional forms and vertically integrated hierarchies. This results in greater flexibility, adaptive capacity, and higher levels of organizational and interorganizational adjustments for the more decentralized firms (Chesbrough & Teece, 1996). Therefore it expected that:

Hypothesis 3a: Higher levels of centralization will be associated with lower levels of interorganizational adjustments.

Product-Market Strategy and Interorganizational Adjustment

Most researchers agree that a firm's failure or success can be related to the firm's strategy. However, there is less agreement about what strategy is (Barney, 1997). The most common definitions of business strategies stress that relationship between top management direction and the attainment of firm objectives (Glueck, 1980) and maintaining the firm's relationship or fit with the environment (Higgins, 1983). In the classic, hierarchical view of strategy, top management develops a mission and objectives for the organization and then develops and promulgates the firm's strategy which will guide organizational actions (Barney, 1997).

Many researchers have adopted contingency or strategic choice approaches in their efforts to develop theories of strategies and the study of the competitive environment (Galbraith & Schendel, 1983; Barney, 1997) and there are a number useful typologies which were introduced relatively early in the field's development (Utterback & Abernathy, 1975; Hofer & Schendel, 1978; Miles & Snow, 1978; Porter, 1980). Although each firm's strategy is unique, researchers have found it useful to classify business strategies into typologies in order to more effectively study the relationship between strategy and other organizational, managerial, and environmental variables (Parnell & Wright, 1993). An important part of the typology is the product market strategy. One of the most commonly used and thoroughly researched frameworks was developed by Miles & Snow (1978). It has its foundation in the strategic choice perspective (Child, 1972) and is theoretically well established (Thomas & Venkatraman, 1988) and empirically supported (Hambrick, 1983).

The Miles & Snow typology is based on the organization's adaptive cycle which contains entrepreneurial (product-market), engineering (technological), and administrative problems. In discussing the product-market strategies of firms, Miles & Snow's strategic typology defines prospector strategies as having the flexibility and desire to pursue new product and market opportunities that might appear. In defender strategies, firms are less flexible in order to keep the firm focused on its current products, market, and cost containment. Firms pursuing analyzer strategies emphasize product-market stability while at the same time maintaining the flexibility to enter new markets which have been proven to be

profitable for other firms. Reactor strategies are typically considered non-viable because there is no internal consistency in their adaptive cycle and they react almost randomly to external stimuli.

The link between strategic type and interorganizational relationships has been investigated to a limited extent. Researchers have asserted that defender strategies lead to a passive attitude toward interorganizational relationships (Daft & Weick, 1984) because of the defenders very strong internal focus (Shortell, et al., 1990). Firms pursuing prospector strategies tend to be much more aggressive in seeking interorganizational arrangements (Meyer, 1982) in order to be more flexible and adaptive (Shortell, et al., 1990). Therefore it is expected that:

Hypothesis 3b: Prospector product-market strategies will be associated with higher levels of interorganizational adjustments.

Environmental Scanning and Interorganizational Adjustment

One of the greatest challenges facing top managers today is determining how to respond adaptively to perceived environmental changes. Recent research in strategic management has asserted that "the processes of scanning and interpreting environmental changes are clearly critical to organizational performance and viability" (Elenkov, 1997: 287). Organizational and managerial efforts to scan and interpret changes in the environment are the initial step in the process of making organizational and interorganizational adjustments in order to adapt to the environment (Hambrick, 1981). The information gained through

environmental scanning efforts is a key ingredient in the formation and implementation of firm strategies (Hofer & Schendel, 1978).

Environmental scanning is defined as "searching the environment for signals that may be forerunners of significant changes...and choosing the events and decisions that should be observed and followed in order to verify the speed and the timing of anticipated change" Utterback & Brown, 1972: 135). Formal environmental scanning systems often include the explicit tracking of the policies and tactics of competitors and suppliers, market research studies, formalized evaluation of opportunities for new investment, acquisitions and the threat of increased competition, substitutes, or major regulatory changes. There is an underlying assumption that organizational decision makers assess issues actively and that they use conscious and intentional effort to identify and interpret significant events, developments, and trends in the environment (Dutton, 1993).

As the level of information available to top managers regarding the environment continues to increase dramatically (Huber & Daft, 1987), the scanning activities of firms and managers become ever more important in predicting and making the correct adaptive adjustments (Hambrick, 1982). The more top managers seek information about the environment, particularly rapidly changing environments, the better able they are to make appropriate adjustments. Stated more directly, the success of a firm's ability to adapt to anticipated environmental changes through organizational and interorganizational adjustments is largely a function of the quality of its environmental scanning (Chakravarthy, 1982; Ansoff, 1988; Daft, Sormunen & Parks, 1988). Yet, there has been little

empirical research that has examined the relationship between scanning and organizational and interorganizational adjustments (Jennings & Seaman, 1994).

It is likely that firm's which anticipate the need to make organizational and interorganizational adjustments in order to sustain or improve performance will develop processes and methods for gathering information about the external environment. It is also likely that firms that are currently engaging in high levels of adjustment, have these scanning processes and methods in place. Accordingly:

Hypothesis 3c: High levels of environmental scanning will be associated with higher levels of interorganizational adjustments

Organizational Structure and Interorganizational Adjustment

The formal structure of an organization has historically been one of the most often studied organizational variables in relationship to both the external environment and firm strategy (Chandler, 1962; Channon, 1973; Reimann, 1973). Typically, organization structure is implemented to designate formal relationships between managers and supervisors, to identify how organizational members will be grouped together, and to ensure effective communication, coordination, and integration throughout the organization (Child, 1997). The most common classification of organizational structure includes functional, product or divisional, matrix, and network definitions (Miles & Snow, 1986).

The functional organizational structure first appeared during the late eighteenth and early nineteenth centuries in response rapidly growing industrial economies, the explosive growth of organizations, and the age of standardization

(Miles & Creed, 1995; Miles, Miles & Snow, 1996). In functional structures, organizational members are grouped together on the basis of common expertise and experience. Each functional area specializes in some unique domain (such as manufacturing, marketing, accounting, or finance) and then coordinates specialized outputs with centrally devised plans and schedules.

Divisional and multidivisional organizational structures evolved in response to the increasing diversification of firms as the economy continued to grow and shift from the age of standardization to the age of customization (Miles & Creed, 1995; Miles, Miles & Snow, 1996). The divisional structure arranges firm resources around a given product, service, or region. Once established, divisions within the firm are essentially self-contained and have substantial operating authority.

During the heart of the age of customization, the matrix organizational structure became popular during the 1960s and the 1970s in response to market place demands for both the cost efficiencies associated with functional structures and the responsiveness to consumer markets of the divisional structure (Miles & Creed, 1995; Miles, Miles & Snow, 1996). The matrix structure groups individuals together on the basis of both functional expertise and product or project assignment. It allow resources and expertise to be centrally controlled and allocated to product groups or teams as they are needed to respond to market demand.

As economies evolved and began to demand innovation rather than customization, the internal network organizational structure began to emerge

(Miles & Snow, 1986). In an internal network organizational structure, units within an organization buy and sell goods and services as they are required. Internal network members may purchase products or services from either inside or outside the firm depending upon their assessment of cost and performance issues (Miles & Snow, 1994). Essentially, an internal market is established to compete with the external market. Only efficient and productive units within the network firm will continue to survive.

Seminal organizational research found that organic, non-hierarchical structures tend to be more flexible and adaptive and can make adjustments easier and more quickly than mechanistic, hierarchical ones (Burns & Stalker, 1961). It seems clear that organizational structure has evolved as markets and economies have demanded greater flexibility and adaptive capability from organizations (Miles & Creed, 1995). As firms increasingly depend on relationships with other firms, the role of organizational structure in facilitating interorganizational adjustment becomes more important. In the recent decades, theorists have asserted that successful firms have made organizational and interorganizational adjustments more easily by implementing either matrix or network organizational structures (Miles, Miles & Snow, 1996). Therefore, it is expected that:

Hypothesis 3d: Matrix and network organizational structures will be associated with higher levels of interorganizational adjustments.

Communication, Control and Interorganizational Adjustment

Historically, management and organizational control systems have been discussed as a critical component of strategy implementation but few control classifications have been related to strategy implementation, adaptation, and levels of organizational and interorganizational adjustment. Models of organizational control processes have evolved very little since Anthony's (1965: 17) foundational definition of control as "the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization's objectives" in spite of calls for increased research attention to the relationship between control and strategy implementation (Schendel & Hofer, 1979; Simons, 1994).

Organizational control systems are typically defined as information feedback systems and include information-based processes for planning, budgeting, cost control, performance evaluation, resource allocation, and employee rewards (Simons, 1991). In their comprehensive review of process research in the field of strategic management, Huff and Reger find that "how organizations use formal control, incentive and information systems and how these subsequently effect performance are largely unexplored areas in strategy research" (1987:221).

An interesting and potentially useful approach to studying control in organizations is offered by economic historian Richard Edwards and organization communication scholars Phillip Tompkins and George Cheney. In his 1979 book, Contested Terrain Edwards provided a definition that is strikingly similar to those

from organization theory and strategic management. He identified three control strategies for organizations. These are simple control (where an entrepreneur or owner exercises complete control), technical control (where control is embedded in the physical technology of the firm), and bureaucratic control (where control is based on written rules primarily determined by upper management).

Tompkins & Cheney (1985) assert that employee resistance to those control strategies has led to the development of concertive control. In concertive control strategies, control is based on the communication and inculcation of shared values, objectives, and procedures. Concertive control systems are unobtrusive in that they focus primarily on incentives such as security, identification, a common mission (Tompkins & Cheney, 1985).

Several researchers have commented on the effectiveness of concertive control approaches. Studies of the U.S. Forest Service have demonstrated the power and effectiveness of concertive control approaches with a special focus on organizational identification (Kaufman, 1960; Bullis & Tompkins, 1991). Barker (1993) examined self-managing teams (a concertive control strategy) in a small manufacturing company. Barker concluded that self-managing teams "tightened Weber's iron cage of rational control" in that concertive control increased the level of control in the organization (1993: 408).

In recent strategy research, Simons (1994) found that organizational control systems played important roles in adaptation (both evolutionary and revolutionary change). He found that in addition to the traditional functions, control systems are being used by top managers to communicate strategic

agendas, ensure organizational attention to new initiatives, and to overcome organizational inertia (Simons, 1994: 169). Because concertive control strategies have been generally found to be more effective in directing the efforts of organizational members, and because organizational control strategies play an important role in firm efforts to make organizational and interorganizational adjustments in implementing adaptation strategies, it is logical to conclude that:

Hypothesis 3e: Concertive control approaches within an organization will be associated with higher levels of interorganizational adjustments.

It may also be assumed that control systems develop between firms engaged in interorganizational arrangements and that:

Hypothesis 3f: Concertive control approaches between organizations will be associated with higher levels of interorganizational adjustments.

TOP MANAGEMENT AND ADAPTATION

One of the central tasks for top managers in organizations is to interpret information about the firm's external environment, evaluate the distinctive competencies of their organization, formulate, and implement strategies which integrate the internal attributes and external environment of the firm (Mintzberg, 1979). There is an evolving and growing body of literature that highlights the importance of top managers in the process of adaptation and organizational

adjustment to the environment (Wiersema & Bantel, 1993). Because of their demographic characteristics, CEOs will vary in the degree to which they generate and implement multiple courses of action and adjustment for the firm (Hambrick & Finkelstein, 1987).

In 1984, Hambrick & Mason introduced 'upper echelon' perspective in which strategic choices, organizational actions, adjustments, and performance or effectiveness were related to the cognitive and demographic characteristics of top managers or top management teams. Their central premise was that top management cognitive schema could be linked to various strategic choices and ultimately to firm performance. Hambrick and Mason (1984) assert the basic premise that top managers have different experiences and backgrounds which shape the way they filter and assess information. The conclude that different demographic characteristics may be modeled and may serve as an observable proxy for managerial cognition (Hambrick & Mason, 1984).

Empirical investigations into Hambrick & Mason's (1984) basic propositions have been primarily focused on examining demographic characteristics of top managers and top management teams such as age, sex, marital status, level of education, tenure, and functional training. These characteristics are typically compared to performance related measures such as profitability, size, growth, and productivity. Research designs in these studies have usually utilized cross sectional samples and multivariate analysis to relate the demographic characteristics of top management to strategic choices and infer a

causal relationship between the two (Norburn & Birley, 1988; Finkelstein & Hambrick, 1990; Bantel & Jackson, 1989; Wiersema & Bantel, 1992).

A second area of interest to empirical researchers is the use of psycho-social variables as proxies for managerial cognition. Research within this literature stream has examined such issues as locus of control, risk tolerance, learning styles, and decision making characteristics (Gupta & Govindarjan, 1984; Miller & Toulouse, 1986).

CEO Age and Interorganizational Adjustment

A relatively straightforward demographic characteristic to measure is the age of the top executive. There are several reasons to believe that age might have an impact on the type and frequency of strategic choices made by top managers (Bantel & Jackson, 1989). First, several cognitive skills such as learning ability, reasoning, and memory decline as managers get older (Botwinick, 1977; Burke & Light, 1981). Additionally, younger managers are likely to have received their education and training more recently making them more familiar with, and more receptive to, technological innovation, risky changes and more advanced interorganizational relationships (Vroom & Pahl, 1971). Older CEOs are also more likely to be committed to the status quo and existing conditions and can be expected to make lower levels of adjustment than younger managers (Alluto & Hrebiniak, 1975). Therefore, it is possible to assert that:

Hypothesis 4a: Greater CEO age will be associated with lower levels of interorganizational adjustments.

CEO Tenure and Interorganizational Adjustment

While age and tenure are often correlated in practice but confounded in research, it is important to clearly separate the effects of age and tenure (Bantel & Jackson, 1989). It has been found that CEOs with longer organizational tenure have a greater degree of identification and psychological commitment to the status quo and existing organizational solutions and values than do executives with shorter tenure (Stevens, Beyer & Trice, 1978; Staw & Ross, 1980). CEOs with long tenure are often more insulated, organizationally focused, and less open to solutions or actions requiring greater interorganizational interactions (Katz, 1981; Pfeffer, 1983). It is reasonable to assume that CEOs with long tenure may resist organizational and interorganizational change or adjustment. Accordingly, it is believed that:

Hypothesis 4b: Longer CEO tenure will be associated with lower levels of interorganizational adjustments.

CEO Locus of Control and Interorganizational Adjustment

CEOs that have a strong internal locus of control have greater organizational free-will and believe that they can control organizational outcomes by their own strategic choices and actions. It has been shown that a strong internal locus of control for CEOs is an important attribute in initiating organizational adjustments and creating alignment with the environment (Miller & Toulouse, 1986; Powell, 1992). This previous finding that an internal locus of

control constructs CEO beliefs such that their actions and adjustments can lead to better environmental alignment and performance supports the contention that:

Hypothesis 4c: CEO internal locus of control will be associated with higher levels of interorganizational adjustments.

CEO Managerial Philosophy and Interorganizational Adjustment

Miles & Creed (1995) contend that a critical variable in the study of organizational adaptation and adjustment, the top manager's system of organizational beliefs or philosophy of management, has not been explicitly included in existing models of adaptation and change. They assert that including managerial philosophies in strategic contingency and adaptation models will add "configurational richness and improved predictive power" (Miles & Creed; 1995). The only earlier attempt to empirically investigate and link contingency or configurational approaches and managerial philosophies was almost twenty years ago (Meyer, 1978).

Managerial philosophies are made up of assumptions about people in the organization, their capabilities, motivations, and beliefs about how they should be directed and controlled (Miles & Creed, 1995). These philosophies have evolved over the years as various organizational structures and forms have developed (Miles, Miles & Snow, 1996).

Traditional managerial philosophies were strongly influenced by scientific management and Weber's notion of the ideal bureaucracy. These philosophies assumed that while managers could make effective organizational decisions,

workers were given little latitude to exercise discretion and were closely supervised and controlled based on financial rewards (Miles, 1975). Managers assumed the worst about worker intentions and exercised tight, rational control systems.

After World War I, a new managerial philosophy began to emerge that was based on the belief that workers were motivated by social as well as financial considerations. This 'human relations' managerial philosophy assumed that workers needed to feel useful and important and wanted to be recognized as individuals. This philosophy resulted in managerial policies which kept subordinates informed about organizational objectives and progress. Managers listened to the concerns and suggestions from workers and allowed them to have some limited control over routine matters in the workplace (Miles, 1975).

Beginning during World War II and continuing into the 1970s, a new managerial philosophy arose (Miles & Creed, 1995). Miles (1965) designated this new philosophy as the human resources approach and based many of its characteristics on the influential organizational research of that period (Maslow, 1943; Argyris, 1957; McGregor, 1960; Likert, 1961) and his own personal research as well as early work experiences on the Sante Fe Railroad (Heppard, 1998). This philosophy made the assumptions that work was not inherently distasteful to employees, that workers wanted to contribute to the organization, and that most workers had the ability to be far more creative and self-directive than the human relations view had envisioned (Miles, 1975).

Given these assumptions, the manager's basic task is to expand opportunities for worker self-direction and control, create an environment in which all members can contribute, and encourage full participation by implementing meritorious suggestions from employees (Miles, 1975).

Over the past ten years or so, a new managerial philosophy has been evolving in response to the dramatic changes in organizations and their environments (Miles & Creed, 1995). As advanced organizational forms (such as network and cellular forms) have developed, there has been an increasing emphasis on interorganizational skills and capabilities. The human investment managerial philosophy assumes that workers have untapped capabilities and can continually develop their technical, self-governance, and overall business skills. It assumes not only that people are trustworthy, but that they are anxious to improve their ability to contribute to organizational efficiencies and make interorganizational adjustments frequently (Miles & Creed, 1995).

In organizations where top managers have adopted a human investment managerial philosophy, it is expected that subordinates in the organization will be increasingly self-directed and will make improvements and adjustments in order to improve organizational efficiencies (Miles & Creed, 1995). In human investment managerial philosophies, it is expected that the adaptive capacity (the tendency and ability to make adjustments) will be enhanced and that the overall organization will be more agile and flexible, particularly with regard to the interorganizational relationships demanded in the more advanced organizational

forms (Miles & Creed, 1995). Therefore, it is reasonable to expect that when compared with traditional and human relations managerial philosophies:

Hypothesis 4d: Human investment managerial philosophies will be associated with higher levels of interorganizational adjustments.

INTERORGANIZATIONAL STRATEGIES AND ADAPTATION

Over the past decade, the interorganizational arrangements and relationships have become much more important to practicing managers as well as academic researchers. Firms are entering into a wide variety of interorganizational relationships in order to conduct business (Ring & Van De Ven, 1992). As the use of these interorganizational arrangements has dramatically increased, so have questions about their efficacy, benefits, and drawbacks.

One of the first issues to be addressed in the detailed study of interorganizational relationships is how they should be characterized. There have been several useful typologies which attempt to capture the unique characteristics of these relationships (Astley & Fombrun, 1983; Miles & Snow; 1986; Powell, 1990).

Collective Strategy Framework

One of the earliest and more complex typologies was formulated by Astley and Fombrun (1983). This typology categorizes interorganizational relationships on the basis of whether interaction is direct or indirect and whether the interaction

is competitive or cooperative. The overall typology may be referred to as a collective strategy framework with the categories of interorganizational relationships labeled as confederate collective (direct-competition), conjugate collective (direct-cooperative), agglomerative collective (indirect-competition), and organic collective (indirect-cooperative) (Astley & Fombrun, 1983). While some empirical support has been found for this typology of interorganizational relationships (Oliver, 1988), its categorizations are seldom used in current discussions of interorganizational interactions.

Networks: Between Markets and Hierarchies

A second, more simplistic typology was created by Walter Powell (1990). In his development of configurations of interorganizational forms, Powell distinguishes between markets, hierarchies, and networks (1990). In his summarization of key features of each form, market forms are expected to be highly flexible and offer more choice and opportunity than other forms. Information is exchanged freely and alternative relationships are easily to find. Interactions are typically simple and of short duration. Market-like interorganizational relationships are thought to be poor mechanisms for organizational learning or the transfer of technological know-how (Powell, 1990). In sharp contrast, a hierarchical approach eliminates the need for interorganizational relationships through mergers, acquisitions, and massive vertical integration. Strengths in this hierarchical approach include economies of scale and scope as well as high levels of control and accountability (Powell,

1990). The final interorganizational form described by Powell is the network. Network organizations are linked through reciprocal, preferential and mutually supportive actions. Units exist in relation to other firms rather than by themselves. The key advantage of network relationships is their flexibility or that they are "lighter on their feet" than hierarchies (Powell, 1990: 303).

Interorganizational Transactions

A third typology of interorganizational transactions and relationships is provided by Ring & Van de Ven (1992) in their exploration and discussion of alliances and similar cooperative relationships between firms. They synthesize the diverse literature regarding interorganizational relationships into multi-theoretic descriptions of alternative forms or strategies. Their framework has its roots in institutional economics (Williamson, 1975; 1985); organizational sociology (Granovetter, 1985; Barney, 1990; Oliver, 1990), and strategy & organizational theory (Barney & Ouchi, 1986).

Ring & Van de Ven develop four dominant interorganizational forms and describe distinguishing characteristics (1992). Discrete market transactions involve a one time transfer of property rights, economic payments, very limited simultaneous exchange relationships between participants, and are governed by classic market forces. Recurrent contracting transactions involve episodic production and transfer of property rights, certain payment upon completion of contracts, short to moderate durations, and a neoclassical contract market governance structure. Relational contracting relationships involve sustained

production and transfer of property rights, uncertain exchange provisions, moderate or long term relationships, and a relational contracts bilateral governance structure. The final category of interorganizational relationships include hierarchical managerial transactions in which there are on-going production and rationing of wealth, employment exchange relationships, indefinite duration, and an employment contract unified governance structure (Ring & Van de Ven, 1992).

Networks and New Organizational Forms

A fourth and widely accepted description of interorganizational relationships comes from Miles & Snow (1986; 1994). Miles and Snow describe market and hierarchical forms which are very similar to those described in Powell's typology. However, Miles and Snow separate networks into two types, stable and dynamic. Stable networks typically form in predictable value chains and link independent firms with specialized assets. Firms within the stable network are tied closely to a lead or "core" firm in the network by contractual arrangements (Miles, and Snow, 1994: 101). The lead firm centrally coordinates the efforts along the value chain but focus only on its core competencies while it outsources other activities. Interorganizational relationships are stable (last more than one year) and involve a limited number of potential partners. The stable network is expected to be more flexible than the hierarchy but not as flexible as the dynamic network (Miles & Snow, 1994). Dynamic network arrangements have evolved to cope with new, more dynamic, fast-paced environments (Miles &

Snow, 1986). The dynamic network is characterized by extensive vertical disaggregation, short term alliances or relationships (typically a year or less), with independent firms drawn from a large pool of partners along a single value chain (Miles & Snow, 1986). The dynamic network is more flexible than the stable network but not as flexible as the market (Miles & Snow, 1994).

Synthesizing Typologies

Based primarily on the typologies of interorganizational relationships discussed above, two broad categories of interorganizational relationships can be clearly derived. These categories include disaggregated (market-like) interorganizational strategies or forms (markets and dynamic networks) and integrated (hierarchical) interorganizational strategies or forms (hierarchies and stable networks). The relationship between these two broad categories and other typologies is summarized below:

Table 3-1

Interorganizational Strategies or Forms

Researchers	***Disaggregated Relationships (Market-Like)***	***Integrated Relationships (Hierarchical)***
Astley & Fombrun (1983)	Confederate Collective Agglomerative Collective	Conjugate Collective Organic Collective
Powell, 1990	Markets Networks	Hierarchies Networks
Ring & Van de Ven, 1992	Discrete Market Recurrent Contracting	Hierarchical Managerial Relational Contracting
Miles & Snow, 1986	Markets Dynamic Networks	Stable Networks Hierarchies

Disaggregated interorganizational strategies are expected to be characterized by high levels of flexibility and adaptive capacity while integrated interorganizational strategies are expected to be characterized by low levels of flexibility and adaptive capacity. Therefore it is expected that:

Hypothesis 5: Disaggregated interorganizational strategies will be associated with higher levels of interorganizational adjustments.

Modeling or Predicting the Level of Interorganizational Adjustment

The preceding five categories of hypotheses explore the association between individual independent variables (perceived characteristics of the environment, the organization, the top manager, and the interorganizational strategy) and the dependent variable (interorganizational adjustment). Another interesting issue to examine is how much total variance in the level of interorganizational adjustment may be predicted when all of these independent variables are considered together. Because many of the key variables previously investigated in adaptation research are included as independent variables, it is expected that:

Hypothesis 6: Characteristics of the environment, the organization, the top manager, and the interorganizational strategy will predict the majority of variance in interorganizational adjustment.

INTERORGANIZATIONAL ADJUSTMENT AND FIRM PERFORMANCE

Strategic changes and organizational and interorganizational adjustments directed toward ensuring or enhancing the probability of a firm's survival and profitability are of critical importance in the field of strategic management (Chakravarthy & Doz, 1992). The central issues to be examined are strategic choices and adjustments made by top managers to adapt the firm to changes or perceived changes in the environment (Ansoff, 1975; Hofer & Schendel, 1978; Ginsberg, 1988; Barr & Huff, 1997). Research has indicated that firms able to make adjustments typically perform better tan firms that are unable to change (Haveman, 1992; Smith & Grimm, 1987) while other research indicates that firms that are unable to make adjustments perform poorly (Hambrick & D'Aveni, 1988) because of a "downward spiral from which they do not escape" (Barr & Huff, 1997). Good performers make organizational and interorganizational adjustments in order to create a match between the organization and its environment (Miller, 1988; Dollinger & Golden, 1992).

Recently organizational theory and strategic management researchers addressing the issue of firm adaptation have rejected previous notions of incremental and radical change and have begun to stress the importance of continuous, rapid, and relentless change in the survival and profitability of the firm (Eisenhardt. 1989; Brown & Eisenhardt, 1997; D'Aveni, 1994). Brown & Eisenhardt (1997: 13) have described continuous change as follows:

> Try lot's of things. Keep doing the ones that succeed. Switch to new ones when old ones fail. And above all keep moving. As one executive described it, 'you have to keep up with the train.' So, if the essence of strategy is doing what is vital for firm success, then the best strategy for managing unpredictable, relentless change is continuous change. The goal of this strategy is to maintain continued advantage."

A logical extension of continuous change strategy relates to firm performance. Firm performance is a complex and multidimensional phenomenon (Dess & Robinson, 1984). Two common measures in the strategic management literature are return on investment (Hofer, 1983; Barney 1995) and change in market share (Miller & Friesen, 1982; Priem, 1990). Because of the higher levels of adaptation expected in firms that make a large number of adjustments, it is expected that these measures of performance will be related to the level of interorganizational adjustment. Therefore, with regard to organizational performance:

Hypothesis 7a: High levels of interorganizational adjustments will be associated with higher CEO reported return on investment (ROI).

Hypothesis 7b: High levels of interorganizational adjustments will be associated with increases in archival measures of firm market share.

MEASURING INTERORGANIZATIONAL STRATEGY

There have been relatively few empirical efforts analyzing typologies of interorganizational forms or strategies (Oliver, 1990; Dollinger & Golden, 1992). As empirical research efforts such as this one begin to critically assess the assertions of interorganizational theorists, it is important to develop and test measures of interorganizational forms or strategies.

As discussed above, one of the most commonly cited typologies of interorganizational forms was developed by Miles & Snow (1986). They assert that the highly competitive environment of the last two decades has pushed organizations to find new forms that increase organizational adaptability, flexibility, and innovation and that "this new form simply awaits articulation and understanding (Miles & Snow, 1986: 64)." Miles & Snow call this new interorganizational form a 'dynamic network' which assembles interorganizational relationships into a market-like structure. There has been little empirical analysis of this widely asserted interorganizational form. A notable exception is an extension of Miles & Snow's dynamic network characteristics in public service delivery (Lawless & Moore, 1989).

The characteristics of the dynamic network include (Miles & Snow, 1986: 64-65):

> *Vertical Disaggregation*: Business functions such as product design and development, manufacturing, marketing, and distribution which would typically be conducted within a single organization are performed by a number of independent organizations in the network.

Brokers: Because each function is not necessarily part of a single organizations, business groups are assembled by or located through brokers. The broker may play a lead role in the network and subcontract for services or it might create linkages for equal partners in the network.

Market Mechanisms: The major functions within the network are held together primarily by market mechanism such as contracts and payment for results rather than progress reports or personal supervision.

Full-Disclosure Information Systems: Broad-access computerized information systems are used to substitute for lengthy trust-building processes based on experience. Participants agree on a general structure of payment and then join a continuously updated information system.

Based on previous research (Heppard, Chesley, & Koberg, 1996), extensive pilot testing, and comments from Anne Huff, Christine Koberg, and Raymond Miles, the issue of trust was separated from use of broad access computer systems into a fifth characteristic in this study. This was because while some executives related trust to broad-access information systems, others did not. Executives in the 1996 research program and pilot testing for this project stated that they used shared-information systems primarily for ease of ordering and payment and perhaps communication.

Because these measures of dynamic network characteristics theoretically assess the same underlying interorganizational construct, it is expected that:

Hypothesis 8a: Variables measuring dynamic network capabilities will be highly correlated, have high reliability measures, and will load on a single factor.

Dynamic network characteristics as defined by Miles & Snow (1986) more closely approximate the characteristics of a market than an organizational hierarchy. Given this present study's classification of interorganizational relationships into two broad categories of market-like and hierarchy-like strategies or forms, it can be asserted that CEOs which recognize dynamic network characteristics in their firm will report their interorganizational strategy or form as either market or dynamic network. Therefore, it is expected that:

Hypothesis 8b: By examining the degree to which CEOs report the presence of dynamic network characteristics in their firm, it is possible to predict the firm's self-reported interorganizational strategy or form.

CHAPTER IV

RESEARCH DESIGN AND METHODOLOGY

INTRODUCTION

This chapter discusses the research design and methodology used in this dissertation. A large, cross-sectional sample of CEO respondents was developed for this study. The selection of a research methodology for the examination of interorganizational relationships, adjustment, and adaptation is difficult because there is justification for both cross-sectional and longitudinal approaches. A cross-sectional approach provides an opportunity to compare a large number of different firms on a large number of variables at a given time. This approach is also effective in providing researchers with an initial idea of which issues seem particularly important at a given time. On the other hand, a longitudinal approach allows the researcher to examine the ways particular interorganizational routines and interorganizational forms have evolved over time.

A cross-sectional approach is appropriate for this study because there has been relatively little empirical research into the interorganizational adjustments and interorganizational strategies examined in this dissertation. The questionnaire developed for this study allows a great deal of information from many CEOs to be gathered relatively quickly and efficiently. It is the first step in what I hope will be a long term examination of interorganizational phenomenon. Follow-up, semi-

structured interviews were used to gather some limited longitudinal data as well as to clarify ambiguous findings from analysis of the questionnaire.

DATA GATHERING APPROACH

The issues of interorganizational adjustment, adaptation, and interorganizational strategies are very complex. In order to address this complexity, this dissertation employs a multilectic research approach using two dissimilar approaches to data collection (Huff, 1981). Denzin and others argue that researchers in the social sciences "must learn to employ multiple methods in the analysis of the same empirical events (Denzin, 1989: 13)." No single method is robust enough to completely explore all of the relevant aspects of "the real world" of organizations. This dissertation employs two research methodologies in the investigation of interorganizational relationships.

The primary approach employed in the study is a survey questionnaire mailed to over 1100 general managers and chief executive officers in the aerospace, biotech/pharmaceutical, and electronic component industries. The questionnaire obtains data about the manager, the firm, managerial perceptions of the external environment, internal policies, managerial philosophies, control approaches, organizational structure, interorganizational form, interorganizational relationships, organizational strategy, organizational adjustments, and interorganizational adjustments. The data obtained from the questionnaire were analyzed using standard statistical and multivariate analyses in order to evaluate the research hypotheses discussed in Chapter III.

The supplemental research method was semi-structured interviews (Dexter, 1970) of top managers who volunteered to be interviewed about their response to the mail survey. In addition, interviews were conducted with management consultants and knowledgeable researchers on the topic of interorganizational relationships (Raymond Miles, Mike Hitt, etc.) These interviews were analyzed using qualitative methodological techniques considered appropriate for this type of study including content analysis (Holsti, 1969; Krippendorf, 1980). The results of these interviews have been used primarily to explicate the findings or non-findings from the questionnaire data.

The chapter provides a description of the three industries (aerospace, biotechnology & pharmaceutical, and electronic components) selected to be sampled in this survey and reports on the mail survey executed to test the hypotheses developed in Chapter III, including the source or foundation for each of these variables and questionnaire items used in the survey. Throughout the chapter, potential weakness of this research design are highlighted. Finally, the chapter discusses the follow-up interviews with CEOs which were necessary to add depth and texture to the statistical findings from the mail survey.

THE MAIL SURVEY

"INTERORGANIZATIONAL RELATIONSHIPS AND FIRM ADAPTATION"

In order to test the propositions and hypotheses developed in Chapter III, it was necessary to develop a cross-sectional data base of information from top managers in the three industries studied in this dissertation. As recommended in previous research on firm adaptation (Jennings & Seaman, 1994), a multi-industry approach was used to enhance the generalizability of this study's findings. Information was primarily collected by a questionnaire designed to elicit managerial perceptions of their environment, their organization, themselves, their interaction with other organizations, and the performance of their firm.

Sample Selection

The sample for this study was developed from the 1996 edition of Ward's Business Directory of U.S. Private and Public Companies. Ward's Directory was used because it is a unique source of company addresses, CEO names, and other difficult to obtain information on publicly traded companies, private companies (approximately 90% of the directory) and subsidiaries in the United States. Ward's directory contains information on over 132,500 companies which are listed by Standard Industrial Classification (SIC) code. The directory contains some limited performance data including firm income for many of the firms listed and total sales for each SIC code (Ward's Directory, 1996). An independent firm, Information Access Company, uses multiple sources such as SEC filings, IRS

filings, press releases, trade publications and direct reporting from companies to verify information contained in the directory (Heil, 1996).

Consistent with other research in strategy, firms with less than 50 employees were excluded from the sample because the issues examined in this study may not be applicable to very small firms (Powell, T.C., 1992). The sample was developed by randomly selecting firms from the directory. As suggested in most inferential statistical and sampling methodologies, a random number generation program was used to select the firms in the sample (Glass & Hopkins, 1984). The 350 firms that were randomly sampled in the aerospace and electronic components industries and the 450 firms that were randomly sampled in the biotech/pharmaceutical industry had the same general characteristics in terms of SIC code, size, and age as the firms in the sample frame.

The number of firms in the random sample generated was based on alpha levels of the study hypotheses, the desired power (the probability of correctly rejecting a null hypothesis) for statistical inferences, and the estimated response rate for the questionnaire. Alpha levels in this study are set at .05 in accordance with conventional guidelines for business related studies (Hair, et al, 1995). Cohen (1977) suggests that acceptable levels of statistical power, given an alpha of .05 is 80 percent. In order to obtain statistical power levels of 80 percent given the number and type of hypotheses in this study, between 80 and 100 completed responses are needed from each of the three industries studies (Solo Power Analysis, 1991).

Expected Survey Response Rates

Response rates vary for mail surveys sent to top managers of large firms. The response rates are typically lower than most other mail surveys sent to organizations because top managers have very little discretionary time to devote to completing questionnaires sent to them by academic researchers (Tootelein & Gasdeke, 1987). An example of typical response rates for surveys sent to managers may be found in the following table (Stimpert, J.L., 1992):

Table 4-1

Typical Response Rates for Surveys with CEOs as Addressee

Study	Top Managers Sampled	Response Rate
Margerison & Kakabadse (1984)	5000 CEOs of US Companies	14%
Aupperle, Carrol, & Hatfield (1985)	818 CEOs Listed in Forbes 1991 Directory	30%
Hitt & Ireland (1985)	CEOs of Fortune 1000 Firms	24%
Bracker, Keats, & Pearson (1988)	217 owner/managers of small electronics firms	34%
Hoskisson & Hitt (1988)	CEOs and senior executives of Fortune 1000 firms	25%
Milliken, F.J. (1991)	Top level administrators from liberal arts colleges	36%
Powell, T.C. (1992)	CEOs from firms in Dun's Directory & S&P Register	21%
Koberg, Chesley & Heppard (1995)	Sample of CEOs from Ward's Directory	34%

Based on a these studies and results of the response rate of the pilot survey in this study (24% response with no second mailing), I conservatively estimated that the response rate for this questionnaire would be 25%. Given this

estimated response rate, I determined that the 350 randomly selected firms from each industry studied in this dissertation would be mailed surveys. Therefore, my conservative estimate of the number of completed surveys I would receive was 87. This number of completed surveys would provide adequate statistical power for this dissertation.

Industries Surveyed

The aerospace, biotech/pharmaceutical, and electronic components industries were examined because the firms within these industries are generally expected to face dynamic environments and because advanced organizational forms are expected to be more prevalent than in less dynamic industries (Miles & Snow, 1994; Miles, Miles & Snow, 1996; Brown & Eisenhardt, 1997). Strategic choice or managerial proactivity have been shown to play a greater role in dynamic industries than in more mature and stable industries (Barney, 1986; Oster, 1990; Parnell & Wright, 1993).

The firms to be included in the research sample frame come from the aerospace industry (SIC 3721-Aircraft, SIC 3724-Aircraft Engines & Engine Parts, SIC 3728-Aircraft Parts & Equipment, SIC 3761-Guided Missiles & Space Vehicles, SIC 3764-Space Propulsion Units & Parts, SIC 3769-Space Vehicle Equipment) biotech & pharmaceutical industries (SIC 2833-Medicinals & Botanicals, SIC 2834-Pharmaceutical Preparations, SIC 2835-Diagnostic Substances, SIC 2836-Biological Except Diagnostic) and electronic components industry (SIC 3671-Electron Tubes, SIC 3672-Printed Circuit Boards, SIC 3674-

Semiconductors & Related Devices, SIC 3675-Electronic Capacitors, SIC 3676-Electronic Resistors, SIC 3677-Electronic Coils & Transformers, SIC 3678-Electronic Connectors, SIC 3679-Electronic Components).

The aerospace industry (Standard & Poors, 1995a): Products and services in the aerospace industry are typically very expensive and the industry relies heavily on sales to governments or the major airlines. The industry experienced decreasing sales in all three of its primary sectors (military products and services, government space programs, and commercial products and services) from 1993-1995. Much of this decline was caused by the shrinking budgets of the U.S. military and decreasing demand from commercial aerospace markets. Overall sales in the industry have declined approximately 10% each year during that period. These generally declining sales have created a dynamic environment for many aerospace firms and has lead to major consolidations throughout the industry. Industry experts such as the Aerospace Industry Association expect that revenues may have hit their low point in 1995 and that the industry will remain stable or perhaps will enjoy some very limited (3%) growth.

The industry underwent major restructuring during the early 1990s. This restructuring was characterized by widespread downsizing and cost cutting. Many military contractors have been actively acquiring or divesting units over the last five years. As a result, the industry has dramatically consolidated during this time period with a number of huge mergers such as the Lockheed and Martin Marietta merger and many other smaller acquisitions and mergers. As domestic markets became smaller, many firms began to look for export opportunities in

expanding foreign markets to make up for lost sales. There is a great deal of government control and oversight concerning these foreign military sales and U.S. firms must often work quite hard just to get the government to allow them to compete in foreign markets. In addition to foreign markets, defense firms have been trying to shift to non-defense business such as automotive products, building products and even financial services.

As the Soviet Union collapsed in 1991, so did the primary threat to U.S. defense and the impetuous to spend large amounts of tax dollars on new, more advanced weapon systems. Sales of military products and services, including the sale of aircraft, engines, satellites, missiles, spacecraft and rockets decreased about 16% during the 1993-1995 time period. This decrease followed a 13% decrease over the preceding two years. Projections are that sales will continue to decrease about 5% per year over the next few years. The only exception to this trend has been in the space segment of the industry which has remained relatively constant since 1991.

The military procurement systems has been dramatically revamped over the last five years and a government emphasis on fixed-price contracting and second-sourcing weapon systems along with extensive budget cutting have created competitive forces which have helped to reshape the industry. Because of these reasons as well as the large research and development costs which characterize the industry, many firms have been actively seeking alliances and other interorganizational arrangements which might lead to a competitive advantage in the industry.

In the commercial aircraft industry, the three major aircraft manufactures (Boeing, McDonnell Douglas, and Airbus) have offered pricing concessions as well as lucrative leasing arrangements to customers in order to maintain their business base. Engine makers such as Pratt & Whiteny, General Electric, and Rolls Royce have broken with their past practice of selling to aircraft producers and are now selling directly to potential aircraft buyers. This practice as well as other downsizing pressures have created the most competitive environment in years in the industry. There are signs that the five year slump in airline sales is beginning to end as new demand for replacement aircraft for older systems begins to be felt in the marketplace. Industry experts predict a steady 5%-6% growth in the commercial aircraft industry in the near future.

An exception in the aerospace industry's general decline in sales has been in the commercial space applications section which has enjoyed growth rates of approximately 20% over the last five years. Satellite communications offer the potential for the greatest growth. This growth rate is expected to continue into the near future for products such as satellites, satellite launchers, and ground-based support items such as ground control transmitters and receivers and telecommunications sites. There is also the potential for explosive growth rates as satellite producers such as Hughes Electronics begins to offer customer oriented applications like DirectTV to compliment its sales of direct broadcast satellites.

In the launch vehicle market, development has focused on the manufacture of expendable launch vehicles (Titan, Atlas, and Delta rockets) and more

innovative air launch vehicles such as Pegasus from Orbital Sciences. The growing strength of foreign competition from countries such as France and China have begun to decrease market share. Government leaders such as President Clinton have sighted the importance of maintaining a strong indigenous capability to produce launch vehicle and have initiated several programs such as the X-34 semi-reusable-air-launched rocket project to enhance the competitive position of U.S. companies vis-à-vis foreign competitors.

NASA's budget for space programs has remained almost constant since 1991. Future spending is expected to decline because of lack of public or congressional support for the agency's major programs (the space station, national space transportation system, and the earth observation system). Sales and profit margins are expected to remain low for firms which rely on NASA for sales.

The biotechnology/pharmaceutical industry (Standard & Poors, 1995c): Although the biotechnology and pharmaceutical industries are sometimes studied separately, most studies include both industries because of their close ties. A very simplistic explanation for this pattern is that the pharmaceutical industry often depends on biotechnology for innovation and biotechnology depends on the pharmaceutical industry for funding, production and distribution.

The biotechnology industry is currently one of the most innovative and fastest growing industries in the world economy. The industry is characterized by large investments in research and development which are required in order to remain competitive. The development of new drugs is very costly and time

consuming with commercialization taking between six and ten years. Funding for product development in smaller firms (90% of the firms in the industry have < 200 employees) typically comes from venture capitalists or from relationships with larger pharmaceutical firms. Recently there has a trend toward a consolidation of firms in these types of relationships rather than collaboration.

Pharmaceutical firms have enjoyed a growth in profitability of between 9% and 13% over the past several years. There have also been a number of major acquisitions and mergers in the industry such as the Roche purchase of Syntex for $5.3 billion and Glaxo's acquisition of Wellcome for more than $14 billion. Overall, the industry has been highly dynamic over the last decade due to the development of new therapeutic compounds, the increase in older customers, and the inclusion of prescription benefits in many health insurance programs.

Government intervention in pricing, the growing power of HMOs and large, mail order pharmacies, and increasing cost containment efforts in health care have forced managers in the industry to be highly adaptive.

The electronics components industry (Standard & Poors, 1995b): Since the invention of the transistor and birth of the microelectronics industry in 1948, electronics have been the driving change force in many industries. The electronics components industry enjoyed a period of rapid growth between 1993 and 1995. Sales increased an average of 25% during that time period primarily because of demand for products in the computer and telecommunications industries. Sales also grew rapidly in Southeast Asia (over 30%), Europe (29%), and in Japan (22%). Overall profitability in the industry was also at record levels during this

time period as products changed from being commodity-like to proprietary designs which typically allow a high profit margin.

Memory chips such as metal oxide semiconductors (MOS) and dynamic random access memory (DRAM) were the fastest growing sector of the industry growing almost 40% and 70% respectively per year. There was demand for personal computers which increased the sales of electronic components. Although the industry has tended to be cyclical in the past, the long term outlook for the industry projects continued growth between 15% and 20%. This continued growth is expected because sales of consumer electronics (including products like personal and lap-top computers) are expected to rapidly increase and the complexity and number of components in electronic equipment is expected to increase.

The sales volume in the DRAM market is often volatile but has never suffered a decline. Prices tend to fluctuate more than the number of units sold. During the 1993-1995 time period, an new generation of 16 M-bit DRAMs became available for customers and sales are not expected to reach their high point until around 1998, indicating continued growth in this sector. Foreign competition is stiff in this area with Japan and Korea dominating over 70% of the market.

There are a number of other important electronic components which help define the competitive characteristics of the industry. Static random access memory sales have been increasing about 7% per year, sales of read only memories have increased over 10% per year (primarily because of demand for

video game software), and sales of erasable programmable read-only memories which are produced primarily in North America grew at about 5% during the three year period of this study. The microcomponent sector of the industry, which includes microprocessors, peripherals and microcontrollers, grew approximately 20% per year between 1993 and 1995. This sector supplies such rapidly evolving products as sophisticated personal computer software applications, fax machines, cellular phones, camcorders, and hand-held computers. A major challenge for the industry has been to keep up with the growing technical sophistication and demands of consumers. Many firms in the industry have sought alliances or interorganizational arrangements with firms they supply or provide with complimentary products in order to keep pace with the rapid technological change. This market is dominated by U.S. firms (approximately 65% of the market), partly as a result of policies to avoid second-sourcing or interorganizational relationships with Japanese firms.

Another important product in the industry are application specific integrated circuits (ASICs). Growth in this industry sector was about 20% per year over the period studied. Part of this growth has been fueled by the demand for customized gate arrays which support advanced computed aided design and computer aided engineering projects and software. The sale of programmable logic devices produced through complex electronic programming were also part of the industry growth. This sector has been characterized by dramatic advances in design tools and production processes which have allowed much more customization and lower costs for producers. Firms not keeping up with this

rapid change in manufacturing capability have been forced out of the market or have gone out of business. North American firms had the dominant sales position in this industry (36%) during the 1993-1995 time period.

An additional indication of the increasing growth of the industry is the amount of capital spending electronics components firms have done in order to increase production capacity. American producers increased spending an average of 30% or more per year during the 1993-1995 time period in order to expand their facilities and add more technologically sophisticated means of production in order to increase the power of the products they produce and to lower costs.

The overall electronics components industry is intensely competitive and production cycles are usually relatively short. Because of the requirement to rapidly develop new products to replace those becoming technologically obsolete, research and development costs are extremely high. For example, Intel, one of the leading firms in the industry, spent 9% of its sales ($1.1 billion) for research and development in 1994. Firms must also make large financial investments in complex capital equipment. Typical cyclical changes in demand are exacerbated by fluctuating prices making profitability in this industry difficulty to predict.

Firms have attempted to adapt to this rapidly changing competitive environment in several ways. They have tended to shift away from the production of commodity type products in favor of more proprietary products. An example of this shift is Intel's decision to refuse allowing another firm to produce (second sourcing) its 386 computer chip. Although there was no second source for the chip, it still became an industry standard and demand for the chip was very high.

Intel's profit margin on this proprietary offering was 80% in the first year of production and remained at about 15% in subsequent years. Because of this remarkable profitability, other companies followed Intel's example and began to focus on the sale of proprietary products. In 1994, these "differentiated" products accounted for over half of Texas Instruments semiconductor sales.

Firms have also sought relationships with other firms, both foreign and domestic, in order to remain adaptive and competitive. The formation of joint ventures is one such interorganizational approach. One of these joint ventures which took place in 1994 was between Texas Instruments and Hitachi for the production of DRAM chips. However, as with the VLSI /Intel joint effort to build "Polar" (a chip for hand-held computers), not all such alliances, succeed and have dissolved. Firms have also participated in other interorganizational arrangements such as licensing and the development of producer networks along the electronics value chain.

Period of Analysis

Determining a period of analysis for a survey is often arbitrary or based on researcher convenience (Miller & Friesen, 1980). The period of 1993-1995 was selected for this study because this time period is quite recent and CEOs can provide meaningful information. Also, recent events and perceptions are believed to affect current organizational actions and performance and because firm decision makers tend to consider the recent past, as opposed to the more distant past, when making organizational adjustments (Zammuto, 1983). The three year time

period used in this study is similar to that used by other researchers studying organizational adaptation (Boeker & Goodstein, 1991; Ungson, James & Spicer, 1985).

QUESTIONNAIRE DESIGN AND CONSTRUCTION

The majority of the items on the questionnaire have been used and validated in previous research published in scholarly books and journals. Several of the questionnaire items were developed based on an emerging theory of organizational forms (Miles, Miles & Snow, 1996), interorganizational strategies (Miles & Snow 1986; 1994), and a theory unobtrusive or concertive control (Tompkins & Cheney, 1985) and validated through pilot tests with CEOs, industry experts, and academic researchers.

CEOs as Single Respondents

While several thoughtful articles have questioned the validity of managers' perceptions (Lant, Milliken & Batra, 1992; Starbuck & Mezias, 1996), there is little credible research available to support or contradict the generally accepted belief in the social sciences that CEOs and top administrators can provide reliable information about their organization and the external environment in which it operates (Hrebiniak & Snow, 1980). Therefore, the questionnaire used in this study was designed for, and addressed to CEOs.

The CEO was the only addressee for each organization in the random sample of firms selected in this study. This dependence on one informant might

be seen as problematic because past research has shown that different members of the same organization may view the organization and its environment very differently (Payne & Pugh, 1976). However, the data gathering approach of questioning one informant per organization, particularly the CEO, has been supported by several influential researchers when survey instruments were well designed and executed (Huber & Power, 1985; Jennings & Lumpkin, 1992). Errors in CEO perceptions may also be reduced if the questionnaire used in the study is well designed and validated (Starbuck & Mezias, 1996).

The questionnaire developed in this study was carefully designed based on the comments and suggestions of several researchers (Dillman, 1978; Labaw & Rappeport, 1980; Starbuck, 1981; Dess & Robinson, 1984; Meyer, 1990; Koberg, 1996; Starbuck & Mezias, 1996). Several comments from survey respondents along with relatively high response rates (reported in Chapter V of this dissertation) provide preliminary evidence that the questionnaire used in this dissertation was well designed. Representative comments include:

> *"I seldom respond to these things but your questions are well designed and easy to understand. Good Luck!"*

> *"This questionnaire was well designed and addressed important issues...something lacking in many of the mailings I receive."*

> *"Your questionnaire brought back memories of my PhD survey. It's clear you put a great deal of thought and effort into*

this and I bet you'll get good responses because it is easy to read and complete. This seems like an interesting study."

Field studies and questionnaires using a self-report format in order to collect cross-sectional data are sometimes subject to errors related to consistency, priming, and common method variance (Podsakoff & Organ, 1986). However, these problems are less serious when the information requested in the survey is factual and can be verified by the respondent, such as in this survey. Dependent variables followed the independent variables in the questionnaire (with the exception of ROI) in order to decrease the effect of common method variance (Carter, 1990). Also, Spector (1987) has proposed that method variance can be attenuated with the use of well validated scales and a limited number of single response questions. The questionnaire used in this dissertation uses many established measures and new, non-validated measures used in the study are firmly based in theory and have been refined through extensive pilot testing.

Total Design Method

The questionnaire used in this dissertation was designed and prepared, to a large extent, following the "total design method" described by Dillman (1978) in his book, Mail and Telephone Surveys. Dillman incorporates the major factors and techniques reported by other researchers in this book and claims that using the total design method increases the response rate of a questionnaire as well as the reliability and validity of the data collected. The following summarizes

specific suggestions from the total design method were used in preparing the questionnaire used in this dissertation:

- Personalized cover letters were sent to the CEOs of most firms in the sample. This letter explains the purpose of the research, the voluntary nature of the project, and identifies the principal investigator. The letter also has a section where CEOs can indicate that they want a copy of papers written based on information obtained from the questionnaire.
- Letters are printed on bond paper with University of Colorado, Boulder letterhead.
- Terms understandable to managers are used rather than academic "jargon."
- Abbreviations, unconventional phrases, and double negatives are avoided.
- Biased questions are not included in the questionnaire.
- No complex or compound questions are asked.
- A clear time reference (1993-1995) is provided throughout the questionnaire.
- Questions regarding the same issues are grouped together.
- Questions are clearly worded, do not assume too much knowledge on the part of CEO respondents, and are written in lower-case letters.
- Careful pagination ensured that no question was interrupted by a page break.
- Answers are clearly worded and written in UPPER-CASE letters.
- Clear directions on how to complete the items are available throughout the questionnaire.

- The length of the questionnaire is reasonable so CEOs are more likely to thoughtfully complete it (Tootelian & Gaedeke, 1987). In pilot studies, the questionnaire took about fifteen minutes to complete.
- The questionnaire has a vertical flow which is easy to visually follow.
- The questionnaire is designed to be aesthetically pleasing. It was printed by a professional document company on heavy bond paper, has a color cover giving the title of the survey, the name of the principal investigator, and showing a picture of the University of Colorado, Boulder's School of Business Administration. A lined section on the back cover of the questionnaire is provided for respondent comments.
- All questionnaires were numbered so completed questionnaires could be matched with master mailing list and linked with objective data from Ward's Directory .
- Questionnaire booklets were not folded. Mailing envelopes were large enough to accommodate all survey materials.
- Questionnaires were mailed directly to CEOs in University of Colorado envelopes with first class postage metered at the University of Colorado. Higher response rates have been associated with first class postage and official sponsor letterhead (Kanuk & Berensen, 1975; Linsky, 1975).
- Pre-paid and addressed business reply envelopes were included for the convenience of respondents.

Questionnaire Pre-testing and the Pilot Survey

Based on recommendations from Dillman (1978), the questionnaire was extensively pilot tested before it was mailed to the study sample. PhD students

enrolled in Professor Christine Koberg's dissertation methods class were given a presentation on 30 April 1996 about the survey and then asked to complete the survey as though they were a CEO. They were then asked to provide comments and critique of the questionnaire. Seven PhD students provided useful comments regarding various aspects of the survey. Members of the dissertation committee and faculty members from the Management Department at the United States Air Force Academy also reviewed the questionnaire and provided comments and suggestions on how it might be improved. I received helpful comments on how the questionnaire could be changed to better support my research objectives and increase the response rate to the mailing.

Following this initial peer review, I contacted several CEOs on the phone, talked with them about my research and asked them to serve as expert reviewers of the survey before it was mailed. Six CEOs (two from each industry studied) agreed to participate as expert reviewers. I sent them draft copies of the questionnaire in June, 1996. After two weeks, I made an a appointment to discuss the survey over the phone. These expert reviewers provided insightful comments and suggestions regarding how the questionnaire could be tailored to be more understandable to CEOs.

Following these reviews and my presentation of a "Dissertation Questionnaire Prospectus" to my committee on 12 July 1996, I randomly selected fifty firms and CEOs from the Ward's data base to be used in this research project. The number of CEOs contacted in the pilot survey should be large enough to assess the quality of the survey but small enough to avoid detracting

from the overall sample or incurring large pre-survey costs (Hunt, Sparkman, & Wilcox, 1982; Erdos, 1983). I mailed draft versions of the survey to these CEOs. Twelve CEOs (five from the aerospace industry, three from the biotech/pharmaceutical industry, and four from the electronic components industry, responded to the survey) returned completed surveys. This response rate (24%) without a follow-up mailing along with the fact that CEOs completed the entire questionnaire without negative comment gave me confidence in the quality of the questionnaire and I was optimistic that the response rate for the actual survey (including a second mailing to non-respondents) would be approximately 35%.

Executing the Mail Survey

The initial mailing of the questionnaire to the primary sample was sent on 15 August 1996. A follow-up mailing to all non-responding firms was mailed on 13 September 1996. Because the response rate after two mailings was disappointing in the biotech/pharmaceutical industry, a supplemental sample of 100 additional firms was randomly drawn from Ward's Directory. The first mailing for this supplemental sample was sent on 8 October 1996. A follow-up mailing to all non-responding firms in the supplemental sample was mailed on 8 November 1996.

It appears there may be several reasons for the low response rate in the biotech/pharmaceutical industry. First, the number of undeliverable questionnaires was higher than in the other industries samples. This seems to

indicate that there is a greater tendency for biotech/pharmaceutical firms to disband, be acquired, or relocate than firms in the other industries sampled. Representatives for Ward's directory gave assurances that the relatively high number of undeliverable questionnaires was not related to a lack of updating and research on the part of Ward's. Instead, the spokesman postulated that perhaps this industry is just quite volatile (Heil, 1996). Another possible reason for a low response rate is that the biotech/pharmaceutical industry is currently a favorite with researchers and perhaps CEOs are inundated with surveys. This possibility was borne out in several comments I received from CEOs in the biotech/pharmaceutical industry including these two typical examples:

> *"This industry must be the most studied and least understood industry in the world today! It seems like a get at least one new survey in the mail every day!"*

> *"I just can't keep up with the requests I get for information so I have made it a policy that this company does not respond to surveys."*

Actual Survey Response Rates

Detailed information regarding these mailings for the primary and supplemental samples and actual response rates are presented in the following tables:

Table 4-2
Response Statistics - Primary Sample

	Aerospace	Biotechnology/ Pharmaceuticals	Electronic Components
Primary Sample			
First Mailing			
Questionnaires Mailed	350	350	350
Undeliverable Questionnaires	31 (8.9%)	41 (11.7%)	32 (9.1%)
Returned Incomplete	10 (2.9%)	15 (4.3%)	8 (2.3%)
Completed Responses	81 (16.3%)	48 (13.7%)	62 (17.7%)
Second Mailing			
Questionnaires Mailed	245	254	258
Undeliverable Questionnaires	2 (.8%)	1 (.4%)	2 (.8%)
Returned Incomplete	3 (1.2%)	6 (2.4%)	4 (1.6%)
Completed Responses	40 (16.3%)	32 (12.6%)	36 (14.0%)

Table 4-3
Response Statistics - Supplemental Sample

	Aerospace	Biotechnology/ Pharmaceuticals	Electronic Components
Supplemental Sample			
First Mailing			
Questionnaires Mailed	0	100	0
Undeliverable Questionnaires		11 (11.0%)	
Returned Incomplete		5 (5.0%)	
Completed Responses		32 (32.0%)	
Second Mailing			
Questionnaires Mailed		68	
Undeliverable Questionnaires		2 (2.9%)	
Returned Incomplete		1 (1.5%)	
Completed Responses		9 (13.2%)	

The overall dissertation survey response statistics for both the primary and the supplemental samples are summarized in the following table:

Table 4-4
Response Statistics-Combined Samples

	Aerospace	Biotechnology/ Pharmaceuticals	Electronic Components
Questionnaires Mailed	350	450	350
Undeliverable Questionnaires	33 (9.4%)	55 (12.2%)	34 (9.7%)
Incomplete Questionnaires	13 (3.7%)	27 (6.0%)	12 (3.4%)
Completed Questionnaires	121 (37.4%)	112 (24.9%)	98 (28.0%)
Response Rate*	42.3%	35.2%	34.8%

*Response rate is calculated as $\frac{\text{(completed questionnaires + incomplete questionnaires)}}{\text{(questionnaires mailed - undeliverable questionnaires)}}$

Following-Up on Incomplete Questionnaires

In order to get the highest response rate possible in the survey, I worked very careful to get fully completed questionnaires whenever possible. Over the course of the survey, forty-five questionnaires were returned with only a few questions unanswered or with several sections missing (indicating that perhaps the CEO had mistakenly skipped a page in the questionnaire). In cases where only a single question was unanswered, I called the company and spoke with a secretary or administrative assistant to bring this omission to the attention of the CEO. After my initial conversations, I would either set up a time to talk to the CEO directly, send a fax to the CEO's attention, or send an e-mail message to ask for the information. In cases where entire pages were skipped, I either faxed or sent the omitted pages to the CEO after first notifying their administrative assistant.

Remarkably, no CEO refused my request to complete a questionnaire they had already partially responded to. It seemed that once CEOs had made a commitment to participate in the survey and had invested their time in completing the questionnaire, they were motivated to complete the process. I believe these follow-up actions were important in obtaining the relatively high response for this survey and the quality of the data set. It seems particularly noteworthy that more technologically advanced forms of CEO survey contact (fax and e-mail) are very useful as follow-up tools to increase the response rate to a mailed questionnaire.

Following-Up on Completed Questionnaires

I performed several follow-up actions which might be listed as "good survey etiquette." I offered to send copies of articles which result from this study. This offer is typical in survey research and not innovative. However, I also sent a personalized, handwritten post card to each CEO that participated in the survey and also sent a small gift (a Colorado Buffalo golf ball) to each CEO that provided helpful written comments or who volunteered to participate in the interview phase of this research. While an extensive follow-up on this particular survey has no impact on its response rate, I'm hopeful that future researchers who send surveys to my respondents might enjoy a slightly higher response rate because of my follow-up activities.

Variables and Questionnaire Items

Interorganizational Adjustments: A key variable which serves as both a dependent and independent variable in the hypotheses discussed earlier in this dissertation is the level of interorganizational adjustments made by a firm. This variable also describes the level of interorganizational flexibility or interorganizational adaptive latitude of the firm. The level of interorganizational adjustments made by a firm during the 1993-1995 time period were obtained in section XIII of the questionnaire. This measure is a modification of a scale developed by Ungson, James, and Spicer (1985) and adapted by Koberg (1987). The modification for this study was based on various important articles and books which identify a range of interorganizational actions available to firms (Thorelli, 1986; Powell, 1990; 1992; Ring & Van De Ven, 1992; Yoshino & Rangan, 1995) which are hypothesized to be undertaken in ascending order of cost based on the principal of minimum intervention (Hrebiniak & Joyce, 1984; Koberg, 1987).

Environmental Uncertainty: One of the independent variables hypothesized to be related to the level of interorganizational adjustments is environmental uncertainty. Firms facing environments perceived to be uncertain are expected to make more organizational adjustments than firms in environments perceived to be more placid (Carter, 1990; Wiersema & Bantel, 1993; Miles & Snow, 1994). The CEO's perception of environmental uncertainty (or change in the external environment) from 1993-1995 was obtained in section III.C. of the questionnaire using a 10-item measure developed by Duncan (1972).

Environmental Heterogeneity: Another characteristic predicted to be related to the level of interorganizational adjustments is environmental heterogeneity. Environments which are perceived by top managers as offering a greater variety of choices with regard to markets, suppliers, and customers are expected to be related to higher levels of interorganizational adjustment (Miller & Friesen, 1982; Hambrick & Finkelstein, 1987; Miles & Snow, 1994). CEO perceptions of environmental heterogeneity between 1993 and 1995 were obtained in section III.B. through a 3-item scale developed by Miller & Friesen (1982).

Environmental Munificence: Managers perceive a munificent environment when they believe there is an abundance of resources to support growth. Managers perceive scarcity in the environment when resources for growth and, perhaps, organizational survival, are difficult to obtain. When managers perceive a munificent environment, they expect to be able to obtain or control scarce resources and avoid resource instabilities that are disruptive to the organization (Koberg, 1987; Pfeffer & Salancik, 1978). In an environment perceived to be munificent, managers are expected to make a low level of interorganizational change. Perceived environmental munificence was obtained in section III.A. through a 5-item scale developed by Miller & Friesen (1982) and modified slightly for this study.

Price Competition: Some environments are perceived to be more competitive with regard to what price a firm may offer its products or services. In highly price competitive environments, firms will tend to make fewer

interorganizational adjustments because of increasing the firm's costs (perhaps only in the short term) (Birnbaum, 1984; Hambrick & Finkelstein, 1987; Miles & Snow, 1994). CEO perceptions of the level of price competition facing their firms were obtained in section III.D. of the questionnaire using a reverse scored scale developed by Negandhi and Reimann (1972).

Centralization: It is expected that firm flexibility is increased when top managers delegate responsibility, decentralize power, and allow workers to exercise judgment (Miles & Snow, 1994; Miles, Miles & Snow, 1996). In firms where decision making and responsibility are centralized, interorganizational change is expected to be more infrequent. The CEO's perception of the level of centralization in a firm during the 1993 through 1995 was obtained in section IV.B. of the questionnaire. This section measures centralization with a seven, 5-point Likert items developed by Hage and Aiken (1969) and modified by Miller and Friesen (1982).

Strategic Type: Top managers may choose to pursue various strategies, some of which require more flexibility than others. Miles and Snow (1978) described four strategic types: prospector, analyzer, defender, and reactor. It is expected that greater levels of interorganizational adjustment will be associated with prospector strategies. In section XI of the questionnaire, the CEO reported the competitive strategy pursued by the firm between 1993 and 1995 using descriptions developed from Miles and Snow (1978) and adapted by Conant, Mokwa, and Varadarajan (1990) and Beekun and Ginn (1993).

Scanning: Managers that typically make interorganizational adjustments based on changes they perceive to occur in the environment are expected to be concerned about monitoring the firm's external environment through various scanning activities (Hambrick, 1982; Yasai-Ardekani, 1986; Dutton & Jackson, 1987). CEOs answered several questions about environmental scanning in section IV.A. of the questionnaire. This section measures the frequency of scanning activities during the time period of 1993-1995 with seven, 5-point Likert items which are adapted from the work of Miller and Friesen (1980). CEOs indicated the extent to which their firm routinely gathered the opinions of customers, tracked the policies of competitors, tracked the policies, tactics and prices of suppliers, conducted special market studies, developed long term forecasts of sales, profits, markets, technology, and planned for long term investments.

Internal Organization Structure: Managers play a large role in creating or recreating the internal structure of their organizations (Chandler, 1962). Newer organizational structures such as matrix or network structures are thought to be more flexible and capable of interorganizational adjustment than the more traditional functional or divisional structures (Miles & Snow, 1978; Miles & Snow, 1994). In section VII of the questionnaire, the CEO selected the description that best fit the internal organizational structure of the firm. This item was developed based on descriptions found in the work of Miles and Snow (1978; 1994).

Control: CEOs do much to define and formally and informally negotiate with employees the type of internal communication and control used in an

organization. Communication and control systems have been broadly defined as simple, technological, bureaucratic and concertive (Edwards, 1981; Tompkins & Cheney, 1985; Barker, 1993). It is expected that concertive communication and control systems will be associated with tighter control, greater managerial direction toward organizational goals and outcomes, and therefore high levels of adjustment (Tompkins & Cheney, 1985). In section VII.A. of the questionnaire, the CEO reported the internal communication and control system that they believed existed at the firm between 1993 and 1995. This item was developed based on the work of Tompkins & Cheney (1985) and comments from CEOs during the pilot phase of the survey process.

Organizational Adjustments: This variable also describes the level of organizational flexibility or organizational adaptive latitude of the firm. The level of organizational adjustments made by a firm during the 1993-1995 time period were obtained in section XII of the questionnaire. This measure is a scale developed by Ungson, James, and Spicer (1985) and adapted by Koberg (1987).

CEO Tenure: Many researchers have hypothesized that long tenure for a CEO is associated with performance persistence and the organizational stability (lack of change) of a firm. Shorter CEO tenure is generally associated with organizational flexibility and strategic change (Tushman & Romanelli, 1985; Finkelstein & Hambrick, 1990; Wiersema & Bantel, 1993). CEOs reported their tenure with their firm in section I of the questionnaire which provided background information on CEOs.

CEO Age: CEO age has been linked to firm growth, riskier strategies, and increased flexibility since younger managers may have less commitment to the status quo at their firms (Alluto & Hrebiniak, 1975; Stevens, Beyers & Trice, 1978; Bantel & Jackson, 1989). In this study, it is expected that higher CEO age will be associated with lower levels of interorganizational adjustments. CEOs reported their age in section I of the questionnaire which provided background information on CEOs.

CEO Locus of Control: CEOs with an internal locus of control have been shown to believe that they have some control over organizational outcomes and will therefore be more likely to initiate organizational changes (Miller & Toulouse, 1986; Powell, T.C., 1992). In this study, internal locus of control is expected to be associated with a higher level of interorganizational adjustments. CEOs indicated the accuracy of several questions about their attitudes and values in section V. of the questionnaire. This section measures the managers locus of control with five, 5-point Likert items which are taken from the work of T.C. Powell (1992).

Managerial Philosophy: Managers have four basic approaches in dealing with their subordinates including a directive approach, a human relations approach, a human resources approach, and a human investment approach (Miles & Creed, 1995; Miles, Miles & Snow, 1996). Organizations with managers who adopt a human resource or human investment model with regard to their employees tend to be more flexible because of the adaptive skills and managerial capabilities of their workforce. In this study, it is expected that

interorganizational adjustments will be greatest in firms where managers adopt a human resources or human investment philosophy. In section VI. of the questionnaire, the CEO reported the managerial philosophy that they believed existed at the firm between 1993 and 1995. This item was developed based on the work of Miles & Creed, (1995), Miles, Miles & Snow (1996) and comments from CEOs during the pilot phase of the survey process.

Interorganizational Strategies: Managers may choose to pursue a number of interorganizational strategies (Astley & Fombrun, 1983; Miles & Snow, 1986; 1994, Powell, 1990; Smith & Van de Ven, 1992). In a widely accepted article discussing new organizational forms, Miles and Snow (1986) identify four interorganizational strategies which a firm may pursue: market strategies, dynamic network strategies, stable network strategies, and hierarchical or acquisition/integration strategies. It is expected that firms with dynamic network strategies and market strategies will have the highest level of interorganizational adjustments. In section XI. of the questionnaire, the CEO reported the interorganizational strategy that they believed existed at the firm between 1993 and 1995. This item was developed based on the work of Miles & Snow (1986), Thorelli, (1986), Miles, Miles & Snow (1996) and comments from CEOs during the pilot phase of the survey process.

Financial Performance: Firms typically make adjustments in response to changes in the environment in order to improve financial performance (Powell, T.C., 1992). Firms with higher levels of interorganizational adjustments in environments which are perceived to be changing are expected to maintain a

better fit with the environment and enjoy better financial performance than firms that make fewer changes. Measuring financial performance is typically a difficult and controversial issue in strategy research (Venkatraman & Ramanujam, 1986). As in previous research (Venkatraman & Prescott, 1990; Powell, T.C., 1992) an efficiency view of performance is used and operationalized as the return on investment (ROI) of the firm. ROI is often used to operationalize financial performance of a firm (Hofer, 1983; Barney 1995) and is has been found to be strongly correlated with other relevant measures of performance (Buzzell & Gale, 1987). CEOs reported their average annual ROI during the period of 1993-1995 in section I. of the questionnaire. Self-report of ROI is necessary in this study because many of the questionnaire respondents are from privately held firms or subsidiaries.

In order to increase the validity of findings regarding performance, an additional measure of performance, the change in SIC share of sales for a firm from 1993-1995, was obtained from an archival source, Wards Directory for approximately 42% of respondents to the survey. Changes in firm sales and market share has been used by previous researchers (Miller & Friesen, 1982; Priem, 1990) to indicate firm performance, particularly in firms which were not publicly traded and where accounting measures of performance were particularly difficult to obtain (Dess & Robinson, 1984). Only a small number of respondents to this survey are CEOs of publicly traded firms where full financial information is available. A summary of the number of firms for which performance data was obtained can be seen in the following table:

Table 4-5
Performance Data

	Aerospace	Biotechnology/ Pharmaceuticals	Electronic Components
Respondent Firms	121	112	98
Self-Reported ROI	121 (100.0%)	112 (100.0%)	98 (100.0%)
Market Share Increase (Ward's)	50 (41.3%)	42 (37.5%)	47 (48.0%)
Full Financials (Publicly Traded)	3 (2.5%)	10 (8.9%)	6 (6.1%)

Dynamic Network Characteristics: In addition to a broad definition of a dynamic network interorganziational strategy, Miles & Snow (1986) identified several key characteristics they expected to be typical in dynamic network strategies. If Miles and Snow (1986) are correct, it is expected that firms pursuing dynamic network strategies will exhibit these characteristics. CEOs answered several questions about dynamic network characteristics of their organization between 1993 and 1995 in section X.B. of the questionnaire. This section asks CEOs to assess the accuracy of five, 5-point Likert statements about vertical disaggregation, broker activities, payment for results, shared information systems, trust of other firms. The first four of these statements are developed directly from the work of Miles & Snow (1986). The final statement regarding organizational trust was developed based on the work of Heppard, Chesley, & Koberg (1996) and comments from CEOs, Anne Huff, and Raymond Miles during the pilot phase of data gathering for this dissertation.

FOLLOW-UP INTERVIEWS WITH CEOs

The personal interview is the favorite tool of qualitative researchers and, if properly executed, is an effective approach in multi-method research designs (Denzin, 1989). In order to add qualitative depth to the findings of the mail survey in this study, personal interviews were conducted with two CEOs from each of the three industries examined as well as with a management consultant who advises CEOs on interorganizational relationships. A management consultant was included because he has a number of clients involved in interorganizational relationships and can highlight similarities or differences in interorganizational approach among a number of client companies. This is a relatively minor but innovative aspect of this study.

Potential Interview Subjects

Initial contact with potential CEO interviewees was made with the mailed questionnaire. Along with the questionnaire sent to each CEO, a cover letter asked each CEO if the would be willing to participate in a follow-up interview. This approach turned out to be quite successful and eliminated the need to make numerous "cold calls" to find potential interview subjects. Thirty-five CEOs indicated that they were willing to participate in an interview.

An information sheet was prepared for each potential interviewee. This sheet contained supplemental archival information for each company (this information had been collected for all companies in the study) as well as specific contact information about the potential interviewee. Additionally, each potential

interviewee's company was researched on the world wide web and through other sources so the most detailed information available could be used in preparation for the interviews.

Contacting Interviewees

Company telephone and fax numbers were obtained from Ward's Directory. I first called the company's general number and asked for specific contact information for the CEO. In each case, I was given postal address, e-mail address, telephone and fax numbers for the CEO.

After this initial contact with the company, I called the CEO's direct telephone numbers. In each case I spoke to an executive secretary or an executive assistant to the CEO. I briefly introduced myself as a doctoral candidate from the University of Colorado, explained that the CEO had taken part in the mail survey and volunteered to be interviewed, and asked if I could fax a letter to the CEO explaining the purpose, duration, and format of the question along with examples of the types of questions I would be asking. In these letters, CEOs were assured that their responses would remain confidential and that they would only be referred to as the CEO of a large aerospace, biotech/pharmaceutical, or electronic components firm. In each case, the CEO's assistant agreed to present the fax to the CEO and contact me regarding the CEO's willingness to participate in the interview phase of this study.

CEOs from the aerospace industry and electronic components industry responded within a two days of my faxed requests for interviews. Because there

were more than two CEO volunteers for the interviews, I reviewed the questionnaires received in the earlier phase of the study and selected CEOs who reported good performance and who had made interesting comments on the questionnaire. Finding interview volunteers from the biotech/pharmaceutical industry was not as simple. It required additional follow-up calls and faxes to get a response from biotech/pharmaceutical CEOs but eventually two CEOs agreed to be interviewed.

Conducting the Interviews:

Because it was not possible to conduct all interviews with the CEOs in person, all interviews were conducted over the telephone. Appointments were arranged (and often rearranged a number of times) with each CEO's assistant in order to find a convenient time and date for the interview.

When CEOs were contacted at the agreed upon time, I introduced myself, explained the purpose of the interview and asked if the CEO had any questions. Most had no questions and several told me of their preparations for the interview. I was surprised that in several cases they had sent the pre-interview letter that I had faxed to key members of their staff so that the CEO could provide the most accurate and in-depth information available on the topics I was interested in. In retrospect, I believe that faxing a number of the interview questions to the CEOs well before the scheduled interviews greatly enhanced the quality and quantity of their responses.

During the actual interview with the CEO, I asked open-ended questions about important issues in the study and unresolved issues from the questionnaire. The questions were very similar to those faxed to each CEO before the interview although I did not constrain the interview if it seemed to be moving into other interesting areas. Typical CEO interview questions included:

- What type of general strategy does your company pursue?
- What are the characteristics of the environment in which your firm competes?
- How does your firm collect information about your industry and markets?
- How flexible or able to change is your firm?
- Do you do anything to enhance the organization's flexibility?
- What levels of management are responsible for various decisions at your firm?
- Do you have control systems that help you meet company goals?
- Generally, how is your company organized (structured)?
- Do you have an overall strategy for developing relationships with other firms?
- What things seem most important in your relationships with other companies?
- Do you try to change the organization when you sense changes in the marketplace?
- What types of changes do you make within your organization?
- What types of changes do you make in relationships with other firms?
- Do you have an overall managerial philosophy in dealing with employees?

Questions for the management consultant were a bit different in that they addressed characteristics of client firms and trends observed by the consultant. The general questions asked during the consultant interview were as follows:

- What type of general strategies do your clients pursue?
- What are the characteristics of the environment in which your client firms compete?
- How do your clients collect information about their industry and markets?
- How flexible or able to change are your clients?
- Do your clients do anything to enhance their organizations' flexibility?
- What levels of management are typically responsible for various decisions at your clients' firms?
- Do your clients have control systems that help them meet company goals?
- Generally, how are your client companies organized (structured)?
- Do your clients have an overall strategy for developing relationships with other firms?
- What things seem most important in your clients' relationships with other companies?
- Do your clients try to change their organizations when they sense changes in the marketplace?
- What types of changes do your clients make within their organizations?
- What types of changes do your clients make in their relationships with other firms?
- Do your clients have an overall managerial philosophy in dealing with employees?

Each interview lasted between 45 minutes and one hour. All interviews were tape recorded with the permission of the CEO and then transcribed for later analysis. Copies of the edited interview transcripts were sent to each CEO along with a small thank you gift (UC Boulder pen). Several CEOs sent follow-up letter thanking me for the pen and transcript and offering their additional help if it was required.

CHAPTER V

DATA ANALYSIS AND RESULTS

INTRODUCTION

This chapter begins with an examination of the data and comments on the quality of the data and whether it meets the assumptions necessary for the planned statistical analyses. The chapter then discuses the statistical tests used to examine each hypothesis developed in Chapter III and systematically reports the findings for each research hypothesis. The chapter also contains representative quotations from the interview phase of this study which add depth and structure to the statistical results.

EXAMINING THE DATA COLLECTED

Before the hypotheses developed in the previous chapter may be tested using various statistical techniques, it is necessary to closely examine the data set in order to ensure that cases are not missing, that outliers do not have undue influence on outcomes of analysis, and that the key assumptions of normality, homoscedasticity, and linearity are not violated. This careful examination of the data helps ensures that the foundation for statistical analysis of this study is sound (Hair, et al., 1995). Variables, labels, means and standard deviations are as follows:

Table 5-1

Variable Labels, Means, and Standard Deviations

Variable	Label	Mean	Standard Deviation	Variable Type
Total Interorganizational Adjustments	TOTXIII	11.70	2.98	Ordinal
CEO Age	AGE	3.47	.674	Ordinal
CEO Tenure	YRSPOS	3.94	1.68	Ordinal
# of Employees	EMPSR	2080	10121	Continuous
Price Competition	IIID	1.68	.592	Categorical
Total Munificence	TOTIIIA	13.24	3.14	Ordinal
Total Heterogeneity	TOTIIIB	7.85	2.76	Ordinal
Total Turbulence/Uncertainty	TOTIIIC	34.60	5.07	Ordinal
Total Scanning	TOTIVA	28.40	6.16	Ordinal
Total Centralization	TOTIVB	30.93	2.77	Ordinal
Human Resource Philosophy	HURESVI3	.43	.50	Categorical
Human Investment Philosophy	HUINVI4	.37	.48	Categorical
Technical Internal Control	TECVIIA2	.16	.37	Categorical
Concertive Internal Control	CONVIIA4	.36	.48	Categorical
Technical External Control	TECVIIB2	.12	.32	Categorical
Concertive External Control	CONVIIB4	.56	.50	Categorical
Internal Organizational Structure	ORGVIII	.24	.43	Categorical
Interorganizational Form	INORGIX	.45	.50	Categorical
Total Organizational Adjustments	TOTXII	14.35	3.38	Ordinal
Total Locus of Control	TOTV	18.39	2.99	Ordinal
Defender Strategy	DEFXI1	.22	.41	Categorical
Prospector Strategy	PROXI2	.24	.43	Categorical
Analyzer Strategy	ANAXI3	.49	.50	Categorical

Missing Data

The problem of missing data was almost nonexistent in this study. This is because completed questionnaires were reviewed as soon as they were received from study respondents. Whenever data was found to be missing (incomplete answers), the respondent CEO was contacted via telephone or fax and asked to provide to omitted data. CEOs complied with virtually all of these requests with the exception of a very small number who did not feel comfortable disclosing

measures of their firm's performance. In cases where a response was missing regarding a variable being tested, that case (CEO responses) was deleted in performing the statistical analysis. Because of the small number of cases where there was missing data from the questionnaires, there was no negative effect on the power of the statistical analyses (Hair, et al., 1995).

Outliers in the Data

Outliers are responses with a unique set of characteristics which are distinctly different from other responses. These substantially different responses are unrepresentative of the population being examined and can degrade the results of statistical analyses which include the outlier case (Hair, et al., 1995). One useful diagnostic method to assess whether a case is an outlier is the Mahalanobis D^2 distance measure. This statistical technique evaluates the position of each observation compared with the center of all observations in a set of variables. Statistical tests of significance with this measure should be very conservative (Hair, et al., 1995) therefore $p<.001$ was selected. With four degrees of freedom, the critical value for Mahalanobis Distance was calculated to be 18.467. Therefore all cases with a Mahalanobis Distance of exceeding 18.467 should be eliminated as outliers. The cases with highest Mahalanobis Distance measures were as follows:

Table 5-2
Most Extreme Mahalanobis Distance Outliers

Case Number	ID Number	Mahalanobis Distance
284	E3052	17.40069
121	A1009	15.93888
283	E3051	14.83439
132	A1020	13.37197
288	E3056	13.27642
160	A1048	13.18255
140	A1028	12.54405
238	E3006	12.44328
46	E2046	11.68518
97	B2097	11.44876

Although no cases exceeded the critical value established for deletion, Case #284 clearly had the most extreme measure of distance and approached the critical value. In order to be as conservative as possible in determining outliers, this case was eliminated in subsequent statistical analyses.

Assumption of Normality

Perhaps the most fundamental assumption for most statistical data analysis is that the variables are normally distributed. Normality refers to the bell-curve shape of the data distribution for all non-categorical variables. If data is found to violate the assumption of normality, it must be transformed in some way to make it amenable to statistical testing.

The most straight-forward diagnostic test for normality is to examine histograms or frequency distributions (Hair, et al., 1995). Stem and leaf charts

were examined for each non-categorical variable in this study. All had very little deviation from normality.

Another way to assess normality is to pair each observed value with its expected value in a normal probability plot (Norusis, 1993). When the sample is from a normal distribution, it is expected that all points fall on or near a straight line (Norusis, 1993). It is clear from the normal probability plot for this sample that non categorical variables are distributed normally.

Assumption of Homoscedasticity

Homoscedasticity is related primarily to the dependence relationship between variables. There is an assumption that dependent variables exhibit an equal range of variance across independent variables. Homoscedasticity is important because when the relationships between multiple independent variables and a dependent variable are assessed, results are less meaningful if the relationship is concentrated in a limited number of variables (Hair, et al., 1995). Homoscedasticity helps to ensure that the variance in the dependent variable is explained across all values of the independent variable. It is possible to test for homoscedasticity graphically by plotting residuals with predicted values of the independent variable. The scatterplot obtained from SPSS multiple regression analysis shows that the assumption of homoscedasticity is valid for this sample as it depicts random scatter about zero (Norusis, 1993).

Assumption of Linearity

An implicit assumption of statistical procedures based on correlation measures of association is linearity. Correlation represents only the linear association between variables and therefore non-linear effects may decrease the value of the correlation (Hair, et al., 1995). The most common way to assess linearity is to examine scatterplots of each variable to be investigated. This was done and no non-linear patterns of association were observed (Norusis, 1993).

Assumption of No Multicollinearity

Another data assumption necessary for the multiple regression is that independent variables are not highly correlated. If independent variables are highly correlated, there may be several negative effects on regression analyses. First, high correlations make it difficult to increase the predictive value of the model by adding additional independent variables. It also makes evaluation of the effects of each individual independent variable more difficult because of the confounding effects of multicollinearity (Hair, et al., 1995). There are a number of ways to check the data for multicollinearity. First the correlation matrix is examined for very high correlations (.90 or higher).

Another method to assess multicollinearity is the examination of tolerance values and their inverse, the variance inflation factor (VIF). Multicollinearity is a concern when the tolerance values are below .19 or VIF values are above 5.3 (Hair, et al., 1995). Based on these general rules, multicollinearity is not of concern in this sample.

Table 5-3
Measures of Multicollinearity

Variable	Label	Tolerance	VIF
Total Interorganizational Adjustments	TOTXIII	N/A (DV)	N/A (DV)
CEO Age	AGE	.8474	1.180
CEO Tenure	YRSPOS	.7776	1.286
Price Competition	IIID	.9258	1.080
Total Munificence	TOTIIIA	.9194	1.088
Total Heterogeneity	TOTIIIB	.8742	1.144
Total Turbulence/Uncertainty	TOTIIIC	.8063	1.240
Total Scanning	TOTIVA	.6840	1.462
Total Centralization	TOTIVB	.9266	1.079
Human Resource Philosophy	HURESVI3	.4817	2.076
Human Investment Philosophy	HUINVI4	.4543	2.201
Technical Internal Control	TECVIIA2	.8020	1.247
Concertive Internal Control	CONVIIA4	.7317	1.367
Technical External Control	TECVIIB2	.7516	1.331
Concertive External Control	CONVIIB4	.6732	1.485
Internal Organizational Structure	ORGVIII	.8677	1.152
Interorganizational Form	INORGIX	.8672	1.153
Total Organizational Adjustments	TOTXII	.8195	1.220
Total Locus of Control	TOTV	.9056	1.104
Defender Strategy	DEFXI1	.2494	4.010
Prospector Strategy	PROXI2	.2260	4.425
Analyzer Strategy	ANAXI3	.1913	5.228

Given the quality of the data sample and the validity of all important statistical assumptions, it is now possible to report on hypothesis testing.

HIERARCHY OF INTERORGANIZATIONAL ADJUSTMENTS

Hypothesis 1a: There is a hierarchy of interorganizational adjustments that can be arranged in ascending order of cost and scope -- vendor and supplier adjustments; adjustments to short term alliances; cooperative marketing, distribution, or production adjustments; licensing and equity investment adjustments; and joint venture adjustments.

SUPPORTED.

The first step in testing this hypothesis is to analyze the means, standard deviations and correlations of interorganizational adjustments.

Table 5-4
H1a Variable Labels, Means, and Standard Deviations

Adjustment	Variable	Mean	Standard Deviation
Vendor & Supplier Relationships	XIII1	3.11	.9552
Short Term Alliances	XIII2	2.52	.9176
Cooperative Arrangements	XIII3	2.35	.8917
Licensing and Equity Investments	XIII4	1.93	.9730
Joint Ventures	XIII5	1.80	.8413

Table 5-5
H1a Correlation Coefficients

	XIII1	XIII2	XIII3	XIII4	XIII5
XIII1	1.000				
XIII2	.3719 (.000)	1.000			
XIII3	.1817 (.000)	.3338 (.000)	1.000		
XIII4	.1028 (.063)	.2847 (.000)	.3679 (.000)	1.000	
XIII5	.1059 (.055)	.3578 (.000)	.3280 (.000)	.4494 (.000)	1.000

As expected, there are significant correlations between interorganizational adjustments.

The next step is to examine the variance in the means of each level of adjustment in order to determine whether there are significant differences among adjustments. In evaluating the ANOVA test, it is possible to reject the null hypotheses that the mean values for the levels of adjustment are the same. There are significant differences between interorganizational adjustments.

Table 5-6
Analysis of Variance

Source of Variation	SS	DF	MS	F	Sig of F
Within + Residual	788.53	1312	.60		
Interorganizational Adjustment	353.07	4	88.27	146.87	**.000**

Given that there is a difference in the level of adjustments, it is possible to determine whether a hierarchy of adjustment exists by doing a series of pre-planned paired-sample t-tests.

Table 5-7
Results of Pre-Planned t-Tests

Variables: XIII1(Vendor & Supplier Adjustments) vs XIII2(Short Term Alliances)

t-value	df	Two-Tail Significance
10.19	328	**.000**

Variables: XIII2 (Short Term Alliances) vs XIII3 (Cooperative Agreements)

t-value	df	Two-Tail Significance
7.19	328	**.004**

Variables: XIII3(Cooperative Agreements) vs XIII4(Licensing/Equity Investments)

t-value	df	Two-Tail Significance
7.19	328	**.000**

Variables: XIII4 (Licensing/Equity Investments) vs VIII5 (Joint Ventures)

t-value	df	Two-Tail Significance
2.47	328	**.014**

Average Values of Interorganizational Adjustments

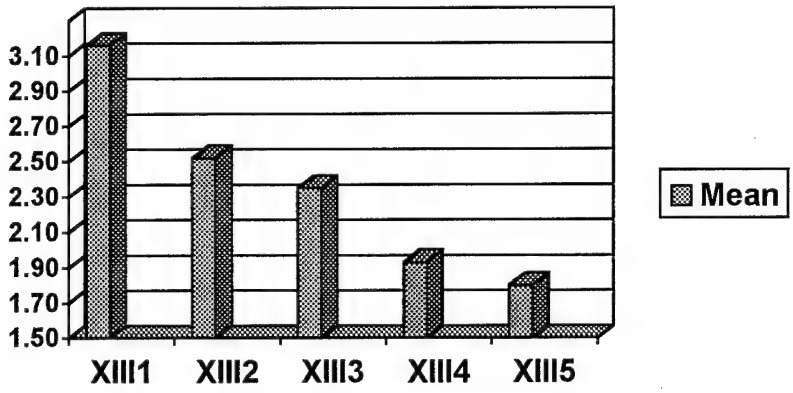

Figure 5-1

The results of these paired sample t-tests demonstrate that a clear hierarchy of interorganizational adjustments existed in the firms responding to the survey. Vendor and supplier interorganizational adjustments occurred more often than all others. There were more adjustments to short term alliances than cooperative marketing, distribution, or production adjustments; licensing and equity investment adjustments; and joint venture adjustments. There were more cooperative marketing, distribution, or production adjustments than there were licensing and equity investment adjustments and joint venture adjustments. And there were a greater number of licensing and equity investment adjustments than there were joint venture adjustments.

> "As we decide what kinds of changes to make in our relationships with other companies, we try to make smart changes. By this I mean we make smaller, less global changes before we consider the more serious ones. For example, we don't want to

change a major strategic alliance if we can get the same effect by doing something at a lower level with similar results...Of course this saves money but, more importantly to me, it doesn't upset our apple cart and bring unwanted consequences for our company (Electronic Components Industry CEO)."

ORGANIZATIONAL AND INTERORGANIZATIONAL ADJUSTMENTS

In reporting on the following hypothesis, it is appropriate to answer two questions (Hair, et al., 1995). The first question regarding whether there is a significant association between the independent and the dependent variables when that only that single independent variable is considered will be answered by looking at correlation coefficients and their level of significance for the entire sample. The second question regarding whether there is a significant association between the independent and the dependent variables when all of the independent variables discussed in the study are considered will be answered by looking at the results of multiple regression analysis (stepwise estimation procedure) for each of the three industries sampled in this study.

Hypothesis 1b: There will be a positive association between the level of organizational adjustments made by a firm and the level of interorganizational adjustments made by the firm

SUPPORTED

Table 5-8
H1b Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	TOTXII	*.4256 (.000)*	*18.22%*
Aerospace Industry Sample	TOTXII	*.3865 (.000)*	*14.48%*
Biotech/Pharmaceutical Industry Sample	TOTXII	*.3989 (.000)*	*15.28%*
Electronic Components Industry Sample	TOTXII	*.5739 (.000)*	*32.77%*

As hypothesized, there was a significant correlation between the level of organizational adjustments and the level of interorganizational adjustment in the total sample and in the aerospace, biotechnology/pharmaceutical, and Electronic components industries. The level of organizational adjustment was an important variable in the stepwise multiple regression equation for the total sample and in the aerospace, biotechnology/pharmaceutical, and Electronic components industries.

> "I don't think we increase our dealings with other companies or make changes in our existing arrangements in order to protect the way we do things within our company. When I think its time to make changes, we make changes across the board...To me, if your serious about meeting a challenge, you change whatever you have to, whether that's inside the company or with our partners (Biotechnology/Pharmaceutical Industry CEO)."

CHARACTERISTICS OF THE ENVIRONMENT

The following section of this dissertation reports the results of hypotheses relating characteristics of the environment and the level of interorganizational adjustment.

Environmental Uncertainty and Interorganizational Adjustments

Hypothesis 2a: Higher levels of environmental uncertainty perceived by top managers will be associated with higher levels of interorganizational adjustments.

PARTIALLY SUPPORTED.

As hypothesized, there was a significant relationship between the level of environmental uncertainty perceived by top managers and the level of interorganizational adjustment in the total sample and in the aerospace and biotechnology/pharmaceutical portions of the sample. Environmental uncertainty was an important variable in the stepwise multiple regression equation for the aerospace industry portion of the sample.

Table 5-9
H2a Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	TOTIIIC	*-.1209 (.000)*	N/S
Aerospace Industry Sample	TOTIIIC	*-.1062 (.049)*	N/S
Biotech/Pharmaceutical Industry Sample	TOTIIIC	*-.3288 (.000)*	*5.14%*
Electronic Components Industry Sample	TOTIIIC	-.1802 (.077)	N/S

"Our world went a bit crazy in the early 1990s. The soviets went away, the defense budget plunged, and the industry consolidated. We really didn't know what was going on or what was going to happen. We did our best to keep up with the changes by changing ourselves. This included changes in the way we did business with other companies including competitors and potential competitors (Aerospace Industry CEO)."

Environmental Heterogeneity and Interorganizational Adjustments

Hypothesis 2b: Higher levels of environmental heterogeneity perceived by top managers will be associated with higher levels of interorganizational adjustments.

NOT SUPPORTED

Table 5-10
H2b Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	TOTIIIB	.0535 (.336)	N/S
Aerospace Industry Sample	TOTIIIB	.0563 (.561)	N/S
Biotech/Pharmaceutical Industry Sample	TOTIIIB	.1394 (.129)	N/S
Electronic Components Industry Sample	TOTIIIB	-.0912 (.377)	N/S

Contrary to expectations, there was not a significant relationship between the level of environmental heterogeneity perceived by top managers and the level of interorganizational adjustment in the total sample or in any particular industry.

Environmental Munificence and Interorganizational Adjustments

Hypothesis 2c: Higher levels of environmental munificence perceived by top managers will be associated with lower levels of interorganizational adjustments.

PARTIALLY SUPPORTED.

Table 5-11
H2c Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	TOTIIIA	*-.1209 (.028)*	N/S
Aerospace Industry Sample	TOTIIIA	*-.1864 (.049)*	N/S
Biotech/Pharmaceutical Industry Sample	TOTIIIA	.0753 (.413)	N/S
Electronic Components Industry Sample	TOTIIIA	-.0742 (.470)	N/S

As hypothesized, there was a significant correlation between the level of environmental munificence perceived by top managers and the level of interorganizational adjustment in the total sample and in the aerospace industry. Environmental munificence was not an important variable in the stepwise multiple regression equation for the total sample or any industry in the sample.

> "We haven't had much trouble getting our suppliers to get us what we need when we need it...We haven't seen the need to develop a lot of long term agreements to ensure delivery...When we deal with our suppliers, we are in the driver's seat...As our military customer has downsized, there is far less demand and plenty of supply (Aerospace Industry CEO)."

Price Competition and Interorganizational Adjustments

Hypothesis 2d: Higher levels of price competition perceived by top managers will be associated with lower levels of interorganizational adjustments.

NOT SUPPORTED.

Table 5-12
H2d Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	IIID	-.0124 (.822)	N/S
Aerospace Industry Sample	IIID	-.0316 (.741)	N/S
Biotech/Pharmaceutical Industry Sample	IIID	.0316 (.732)	N/S
Electronic Components Industry Sample	IIID	-.0769 (.454)	N/S

Contrary to expectations, there was not a significant relationship between the level of price competition perceived by top managers and the level of interorganizational adjustment in the total sample or in any particular industry.

CHARACTERISTICS OF THE ORGANIZATION

The following section of this dissertation reports the results of hypotheses relating characteristics of the organization and the level of interorganizational adjustment.

Hypothesis 3a: Higher levels of centralization will be associated with lower levels of interorganizational adjustments.

PARTIALLY SUPPORTED.

Table 5-13
H3a Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	TOTIVB	*-.1395 (.011)*	N/S
Aerospace Industry Sample	TOTIVB	-.1094 (.251)	N/S
Biotech/Pharmaceutical Industry Sample	TOTIVB	-.1619 (.077)	N/S
Electronic Components Industry Sample	TOTIVB	-.1321 (.197)	N/S

As hypothesized, there was a significant correlation between the level of centralization in the organization and lower levels of interorganizational adjustment in the total sample. However, centralization was not an important variable in the stepwise multiple regression equation for the total sample or any industry in the sample.

> "I don't try to initiate or control every change we make, either within our company or in our dealings with other firms...I think its my job to develop overall goals and policies and then

allow my people to go after them. This gives them the freedom to make the changes we need when we need them...I just don't have the time to do all that (Biotechnology/Pharmaceutical Industry CEO)."

Hypothesis 3b: Prospector product-market strategies will be associated with higher levels of interorganizational adjustments.

SUPPORTED.

Table 5-14
H3b Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	PROXI2	*.2208 (.000)*	*1.61%*
Aerospace Industry Sample	PROXI2	.1550 (.103)	N/S
Biotech/Pharmaceutical Industry Sample	PROXI2	*.2432 (.007)*	N/S
Electronic Components Industry Sample	PROXI2	*.2032 (.046)*	N/S

As hypothesized, there was a significant correlation between prospector product market strategies and the level of interorganizational adjustment in the total sample and in the biotech/pharmaceutical and Electronic components industries. Prospector product market strategies were an important variable in the stepwise multiple regression equation for the total sample.

"We are in the business of finding new businesses. By that I mean we are always looking for new products to get into...I think this drives us to make more changes that companies with a more

stagnant approach to their product lines (Biotechnology/Pharmaceutical Industry CEO)."

Hypothesis 3c: High levels of environmental scanning will be associated with higher levels of interorganizational adjustments.

SUPPORTED.

Table 5-15
H3c Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	TOTIVA	*.2208 (.000)*	*4.75%*
Aerospace Industry Sample	TOTIVA	*.1550 (.103)*	*3.19%*
Biotech/Pharmaceutical Industry Sample	TOTIVA	*.2432 (.007)*	*2.68%*
Electronic Components Industry Sample	TOTIVA	*.2032 (.046)*	*3.58%*

As hypothesized, there was a significant correlation between the level of environmental scanning and the level of interorganizational adjustment in the total sample and in the aerospace, biotechnology/pharmaceutical, and Electronic components industries. The level of environmental scanning was an important variable in the stepwise multiple regression equation for the total sample and in the aerospace, biotechnology/pharmaceutical, and electronic components industries.

"We try to real hard to keep track of what's going on out there. I have two guys who just sit around trying to figure out what's going to happen in the next 5 years. We have people attend

as many industry conferences as we can and we pay attention to what our customers and suppliers tell us...We also subscribe to all of the industry journals to keep up with what's going on...A lot of this information is not quantifiable, but its very important in the way we think about positioning our company, and that relates to the kinds of changes we're making and the way we deal with other companies (Aerospace Industry CEO)."

Hypothesis 3d: Matrix and network organizational structures will be associated with higher levels of interorganizational adjustments.

NOT SUPPORTED.

Table 5-16
H3d Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	ORGVIII	.1002 (.070)	N/S
Aerospace Industry Sample	ORGVIII	*.2379 (.012)*	N/S
Biotech/Pharmaceutical Industry Sample	ORGVIII	.0558 (.545)	N/S
Electronic Components Industry Sample	ORGVIII	.-.0112 (.673)	N/S

Contrary to expectations, there was not a significant relationship between the matrix and network organizational structures and the level of interorganizational adjustments in the total sample and the only significant correlation was found in the aerospace industry sample.

Hypothesis 3e: Concertive control approaches within an organization will be associated with higher levels of interorganizational adjustments.

NOT SUPPORTED.

Table 5-17
H3e Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	CONVIIA4	.0045 (.935)	N/S
Aerospace Industry Sample	CONVIIA4	-.0700 (.464)	N/S
Biotech/Pharmaceutical Industry Sample	CONVIIA4	.0261 (.777)	N/S
Electronic Components Industry Sample	CONVIIA4	.0473 (.645)	N/S

Contrary to expectations, there was not a significant relationship between concertive control approaches within the organization and the level of interorganizational adjustments in the total sample or in any particular industry.

Hypothesis 3f: Concertive control approaches between organizations will be associated with higher levels of interorganizational adjustments.

NOT SUPPORTED.

Table 5-18
H3f Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	CONVIIB4	.0410 (.935)	N/S
Aerospace Industry Sample	CONVIIB4	-.0854 (.371)	N/S
Biotech/Pharmaceutical Industry Sample	CONVIIB4	.1161 (.207)	N/S
Electronic Components Industry Sample	CONVIIB4	.0649 (.528)	N/S

Contrary to expectations, there was not a significant relationship between concertive control approaches between organizations and the level of interorganizational adjustments in the total sample or in any particular industry.

CHARACTERISTICS OF THE TOP MANAGER

The following section of this dissertation reports the results of hypotheses relating characteristics of the top manager and the level of interorganizational adjustment.

Hypothesis 4a: Greater CEO age will be associated with lower levels of interorganizational adjustments.

NOT SUPPORTED.

Table 5-19
H4a Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	AGE	-.0577 (.297)	N/S
Aerospace Industry Sample	AGE	-.0980 (.304)	N/S
Biotech/Pharmaceutical Industry Sample	AGE	-.0604 (.512)	N/S
Electronic Components Industry Sample	AGE	0383 (.709)	N/S

Contrary to expectations, there was not a significant relationship between CEO age and the level of interorganizational adjustment in the total sample or in any particular industry.

Hypothesis 4b: Longer CEO tenure will be associated with lower levels of interorganizational adjustments.

PARTIALLY SUPPORTED.

Table 5-20
H4b Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	YRSPOS	*-.1918 (.000)*	N/S
Aerospace Industry Sample	YRSPOS	*-.2823 (.003)*	N/S
Biotech/Pharmaceutical Industry Sample	YRSPOS	-.1466 (.110)	N/S
Electronic Components Industry Sample	YRSPOS	-.1419 (.166)	N/S

Hypothesis 4c: CEO internal locus of control will be associated with higher levels of interorganizational adjustments

NOT SUPPORTED.

Table 5-21
H4c Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	TOTV	-.0355 (.522)	N/S
Aerospace Industry Sample	TOTV	.0215 (.822)	N/S
Biotech/Pharmaceutical Industry Sample	TOTV	.0289 (.755)	N/S
Electronic Components Industry Sample	TOTV	-.1783 (.081)	N/S

Contrary to expectations, there was not a significant relationship between CEO locus of control and the level of interorganizational adjustment in the total sample or in any particular industry.

Hypothesis 4d: Human investment managerial philosophies will be associated with higher levels of interorganizational adjustments.

NOT SUPPORTED.

Table 5-22
H4d Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	HUINVIV	.0759 (.169)	N/S
Aerospace Industry Sample	HUINVIV	-.0104 (.913)	N/S
Biotech/Pharmaceutical Industry Sample	HUINVIV	.1721 (.060)	N/S
Electronic Components Industry Sample	HUINVIV	.0501 (.626)	N/S

Contrary to expectations, there was not a significant relationship between human investment philosophies in CEOs and the level of interorganizational adjustment in the total sample or in any particular industry.

INTERORGANIZATIONAL STRATEGIES

The following section of this dissertation reports the results of the hypothesis relating interorganizational strategy and the level of interorganizational adjustment.

Hypothesis 5: Market-like interorganizational strategies will be associated with higher levels of interorganizational adjustments.

NOT SUPPORTED.

Table 5-23
H5 Statistical Analysis

Sample	Label	Two-Tailed Correlation	Change in Adjusted R^2
Total Sample	INORGIX	*-.1206 (.029)*	N/S
Aerospace Industry Sample	INORGIX	*-.1912 (.043)*	N/S
Biotech/Pharmaceutical Industry Sample	INORGIX	-.1057 (.251)	N/S
Electronic Components Industry Sample	INORGIX	-.0434 (.673)	N/S

Contrary to expectations, there was not a significant relationship between market like interorganizational strategies and the higher level of interorganizational adjustment in the total sample or in any particular industry. However, its important to note that there were significant negative correlations between market-like interorganizational strategies and the level of interorganizational adjustments made by a firm in the total sample and in the aerospace industry sample. This finding indicates that firms with interorganizational strategies which stress market-like relationships may be making fewer interorganizational changes. This could mean that firms anticipating the need to make a large number of interorganizational changes are implementing more hierarchical interorganizational strategies (stable networks and vertical/horizontal integration).

> "Yes, I do have a strategy for how we deal with other companies, or at least how deeply we get involved with them. My preference is that we limit the number of relationships we have and work real hard on making those relationships good ones. My

experience has been that if you spread yourself too thin and deal with many, many other firms, you end up having your hands tied...I mean that, because you have so many people to coordinate changes with, you do less of that (making changes)...If I see a great deal of change coming our way, I'd rather do that with a few firms I know well instead of many firms that I have limited experience with (Aerospace Industry Executive)."

"I've never said 'this is our strategy for dealing with other companies,' but I do think a strategy has evolved over time...We typically try to do business with a few firms that we know, trust, and who serve us well...I think the strength of our relationships gives us flexibility...I don't think doing business with more people really gives you an advantage (Electronic Components Industry CEO)."

BUILDING THE REGRESSION EQUATION

This section of the dissertation reports the results of stepwise regression analyses and identifies variables which were most important in developing a regression equation to predict the level of interorganizational adjustments made by firms.

Hypothesis 6: Characteristics of the environment, the organization, the top manager, and the interorganizational strategy will explain the majority of variance in interorganizational adjustment.

NOT SUPPORTED.

Table 5-24
H6 Statistical Analysis

Sample	Variable Labels	Change in Adj R^2	B	SE B	Beta	T	Sig T
Total Sample	TOTXII	18.22%	.3274	.0445	.3714	7.362	.0000
	TOTIVA	4.75%	.0936	.0253	.1933	3.696	.0003
	PROXI2	1.61%	.9811	.3510	.1404	.1404	.0055
	(constant)		4.107	.8168		5.028	.0000
Aerospace Industry	TOTXII	14.48%	.2530	.0758	.3093	3.337	.0012
	TECVIIA	5.81%	1.853	.6323	.2481	2.931	.0042
	TOTIVA	3.19%	.1003	.0758	.2149	2.3193	.0012
	(constant)		4.469	1.290		464	.0008
Biotechnology & Pharmaceutical Industry	TOTXII	15.28%	.2868	.0851	.2899	3.372	.0010
	TOTIIIC	4.86%	-.1353	.0513	-.2240	-2.636	.0095
	TOTIVA	2.68%	.0920	.0410	.1889	2.244	.0267
	(constant)		9.937	.8168		3.763	.0003
Electronic Components Industry	TOTXII	32.77%	.4369	.0693	.5087	6.302	.0000
	EMPSR	5.62%	.0004	.0001	.2472	3.152	.0022
	TOTIVA	3.57%	.1073	.0414	.2008	2.595	.0110
	(constant)		2.118	1.361		1.556	.1232

Contrary to expectations, regression equations for the total sample and each industry in the study could not account for the majority of the variance observed in the level of interorganizational adjustments reported by CEOs. As may be observed in the preceding discussion, the regression equations explain less than 50% of the variance in the level of interorganizational adjustments:

Total Sample:	24.58%
Aerospace Industry:	23.48%
BioTech/Pharmaceutical Industry:	22.82%
Electronic Components Industry:	41.96%

Although the levels of variance in interorganizational relationships accounted for in these regression equations are less than 50%, they are far from trivial. They indicate that a significant portion of the variance in

interorganizational relationships may be related to characteristics of the environment, organization, and top management.

INTERORGANIZATIONAL ADJUSTMENT AND FIRM PERFORMANCE

The following section of this dissertation reports the results of hypotheses relating the level of interorganizational adjustment to a self reported measure of performance (return on investment) and an archival measure of performance (market share).

Hypothesis 7a: High levels of interorganizational adjustments will be associated with higher CEO reported return on investment (ROI).

SUPPORTED.

Table 5-25
H7a Analysis of Variance (Total Sample)

	DF	Sum of Squares	Mean Square
Regression	1	7.707	7.707
Residual	327	623.007	1.905

F = 4.045 Significance of F = .045 Adjusted R Square = .92%

As hypothesized, there was a significant relationship between the level of interorganizational adjustment and firm performance in the total sample. While the amount of variance in performance accounted for by the level interorganizational adjustment is low (only about 1%) it is still an important

finding which demonstrates the potential link between adjustment and performance in this sample of rapidly changing industries.

Hypothesis 7b: High levels of interorganizational adjustments will be associated with increases in archival measures of firm market share.

NOT SUPPORTED.

Table 5-26
H7b Analysis of Variance

	DF	Sum of Squares	Mean Square
Regression	1	32.027	32.027
Residual	151	2524.67	16.72

F = 1.916 Significance of F = .168 Adjusted R Square = N/A

Contrary to expectations, there was not a significant relationship between the level of interorganizational adjustment in the total sample and increasing firm market share.

DYNAMIC NETWORK CHARACTERISTICS

In this section of the dissertation, network characteristics developed by Miles & Snow (1986; 1994) are examined. The goal in forming and testing these hypotheses is to contribute to scale development and measurement of network characteristics found in interorganizational relationships.

Hypothesis 8a: Variables measuring dynamic network capabilities will be highly correlated, have high reliability measures, and will load on a single factor.

PARTIALLY SUPPORTED

Table 5-27
H8a Variable Labels, Means, and Standard Deviations

Adjustment	Variable	Mean	Standard Deviation
Vertical Disaggregation	XB1	2.44	1.045
Use of Brokers and Intermediaries	XB2	1.95	1.092
Payment for Results	XB3	3.30	1.182
Broad Access Computer Information Systems	XB4	2.95	1.256
Trust Based on Information	XB5	2.46	1.105

Table 5-28
H8a Correlation Coefficients

	XB1	XB2	XB3	XB4	XB5
XB1	1.000				
XB2	*.4301* *(.000)*	1.000			
XB3	*.1497* *(.006)*	.0921 (.095)	1.000		
XB4	*.1687* *(.002)*	*.1398* *(.011)*	.0295 (.593)	1.000	
XB5	*.3120* *(.000)*	*.3545* *(.000)*	.0885 (.109)	*.2566* *(.000)*	1.000

Reliability Analysis: Alpha = .5458

Table 5-29
H8a Factor Matrix

Variable	Factor 1
XB1	.73808
XB2	.73830
XB3	.28494
XB4	.46748
XB5	.71143

Kaiser-Meyer Olkin Measure of Sampling Adequacy: .67123

Bartlett Test of Sphericity: 156.16 (.0000)

Table 5-30
H8a Final Statistics

Variable	Communality	Factor	Eigenvalue	% of Variance	Cum %
XB1	.54476	1	1.896	37.0%	37.9%
XB2	.54509				
XB3	.08119				
XB4	.21853				
XB5	.50613				

The results in this section indicate that the five variables related to Miles & Snow's dynamic network characteristics are highly correlated and load on a single factor. However, the cronbach alpha (reliability analysis) is below the value of .60 generally accepted as adequately reliable measures of an underlying construct (Nunnely, 1965). This causes some hesitation in recommending these variables as acceptable measures of a single construct (thought to be dynamic network approaches).

Hypothesis 8b: By examining the degree to which CEOs report the presence of dynamic network characteristics in their firm, it is possible to predict the firms self-reported interorganizational strategy or form.

NOT SUPPORTED

One way to assess how well CEO perceptions of dynamic network characteristics predict interorganizational strategy is to develop a logistical regression model which predicts interorganizational strategy based on dynamic network characteristics reported by CEOs. Given the logistical regression equation, a classification table is developed which compares the predictions of the model with the actual interorganizational strategies reported by CEOs. The classification table indicates that the model is little better than guessing what a firm's interorganizational strategy will be.

Table 5-30
H8b Classification Table

	Predicted Strategy Hierarchy-Like	Predicted Strategy Market-Like	Percent Correct
Observed Strategy Hierarchy-Like	142	40	78.02%
Observed Strategy Hierarchy-Like	98	50	33.78
Overall Predictive Success of Model			58.18%

CHAPTER VI

DISCUSSION AND FUTURE RESEARCH

INTRODUCTION

As interorganizational relationships have proliferated over the past ten years and as the these relationships have become more important for the competitive position of firms, managers and researchers have begun to examine the strategy of forging interorganizational relationships more closely. Using a strategic choice perspective, this dissertation empirically examined adaptive interorganizational adjustments, interorganizational strategies, and firm performance.

This chapter reviews the primary findings of the dissertation. The study was built on existing research on adaptation and adjustment (Chandler, 1962; Lawrence & Lorsch, 1967; Child, 1972; 1997; Miles, 1975; Hrebiniak & Joyce, 1985; Meyer, Brooks, & Goes, 1990), especially that of Koberg (1987), regarding organizational adaptation. It examined various interorganizational adjustments and relationships between characteristics of the environment, the organization, the top manager, and interorganizational strategy.

The findings support an intentional view of interorganizational adaptation in that adjustments were made in ascending order of cost and organizational disruption. The results demonstrate that a significant relationship exists between the level of adaptive interorganizational adjustments and adaptive adjustments

made within the organization. The results also indicate that the level of interorganizational adjustment is related to environmental uncertainty, environmental munificence, decentralization, prospector market strategies, environmental scanning, CEO tenure, and hierarchical interorganizational strategies.

With regard to interorganizational change and firm performance, this dissertation finds that a relatively small but significant amount of the variance in firm performance can be associated with the level of interorganizational adjustments made by firms. On the other hand, the amount of variance in performance accounted for by total firm adjustments (organizational and interorganizational adjustments combined) is more substantial. This relationship between adjustment and performance makes an important contribution to evolving theories of continuous change and adaptation.

Finally, this chapter reports that the dissertation partially validates Miles and Snow's (1986) characteristics of dynamic network characteristics. Suggestions are made regarding how Miles & Snow's description of dynamic network organizations might be modified to better reflect the interorganizational reality of the firms in this rather extensive survey of three industries.

The final section of this chapter makes recommendations for future research studies. The importance of longitudinal interorganizational research designs is highlighted. The potential impact of Tompkins & Cheney's typology of control strategies is discussed. Interorganizational innovation is presented as an important area for future study as are international interorganizational

relationships. The final suggestion for future research concerns the investigation of interorganizational adjustments from other theoretic perspectives.

INTERORGANIZATIONAL ADAPTATION

The main purpose of this dissertation was to describe the interorganizationally adaptive firm. Flexible, adaptive organizational designs have been explained and studied in earlier research (eg. Galbraith, 1973; Miles & Snow, 1986; Nohria & Ecceles, 1992). However, little work has been done with regard to flexible, adaptive interorganizational designs. In searching for the interorganizationally adaptive firm, this study extends research from the fields of strategic management and organizational theory about adaptation and flexibility to the interorganizational or meso level. An initial and important contribution this study makes to the search for the interorganizationally adaptive firm is its development of a repertoire of adaptive adjustments available to top managers.

A Repertoire of Adaptive Adjustments

The distinct categories or types of adaptive interorganizational adjustments that firms might make is based on previous theoretical statements (Yoshino & Rangan, 1995; Powell, 1992; Jarillo, 1988; Theorelli, 1986; Miles & Snow, 1986). These alternatives include adjustments to vendor and supplier relationships, adjustments in short term alliances, adjustments to cooperative marketing, distribution, or production arrangements, adjustments to licensing and

equity investment relationships, and adjustments to major strategic alliances such as joint ventures. These categories of adjustments represent varying levels of cost and disruption for the firm. They also effectively describe the range of interorganizational adjustments available to most firms and their managers.

The repertoire, together with the hierarchy of organizational adjustments developed by Miles (1975) and investigated and empirically established by Koberg (1987), constitute the adjustments available to managers as they contemplate or pursue continuous change strategies or to researchers as they investigate the adaptive changes made by firms.

Table 6-1
Hierarchical Repertoire of Adaptive Adjustments

Organizational Adjustments	Interorganizational Adjustments
Procedural Adjustments	Vendor & Supplier Adjustments
Personnel-Related Adjustments	Short Term Alliance Adjustments
Process Adjustments	Adjustments in Cooperative Marketing, Distribution, or Production Arrangements
Structural Adjustments	Adjustments to Licensing & Equity Investment Relationships
Strategic Adjustments	Adjustments to Major Strategic Alliances such as Joint Ventures

A Hierarchy of Interorganizational Adjustment

The statistical validation of a hierarchy of interorganizational adjustments is important because much of the current research on interorganizational

relationships assumes that these arrangements are the result of rational analysis and decision making by managers. However, no empirical research to date has presented evidence that managerial intentionality in interorganizational relationships exists, although Koberg (1987) has demonstrated the existence of a hierarchy of organizational adjustments. The underlying idea is Hrebiniak & Joyce's principle of minimum intervention (1984: 9) which was based on organizational design discussions by Lawrence & Lorsch (1967), Galbraith (1973), and Thompson (1967) as a foundation. More specifically:

> "In implementing strategy, managers should change only what is necessary and sufficient to produce an enduring solution to the problem (Hrebiniak & Joyce, 1984: 9)."

This study successfully extends the principle of minimum intervention to interorganizational relationships. It seems that managers (or at least their organizations) are "intendidly rational" in the way they make interorganizational adjustments. This finding also supports the contention that managers are exercising strategic choice with regard to the types of interorganizational adjustments they are making. Interorganizational adjustments do not occur randomly. Instead, less costly and invasive adjustments are made in greater numbers than the most costly, most invasive adjustments.

More specifically, there are significantly more adjustments to vendor and suppler relationships than there are adjustments to short term alliances. There are significantly more adjustments to short term alliances than there are adjustments to cooperative marketing, distribution, or production agreements. There are

significantly more adjustments to these cooperative agreements than there are to licensing arrangements and equity investments between firms. And, there are significantly more changes to licensing and shared equity arrangements than there are to strategic alliances and joint ventures.

These findings will be important in conversations about strategies that are based on continuous change theories. If, as currently predicted, managers consider continuous change necessary in hypercompetitive industries (Brown & Eisenhardt, 1997; D'Aveni, 1994), managers and researchers will be interested in the repertoire of adaptive adjustments available to them and the relative cost and invasiveness of these arrangements.

This dissertation provides some partial answers to this CEO's plea for information about adjustments that may be initiated by managers.

> "When you talk about making changes, you really cover a lot of ground. I'd like to know what kind of changes other companies are making, what the relative costs of those changes are, and which changes are the most important ones (Biotechnology/Pharmaceutical Industry CEO)."

Influences on Interorganizational Adjustment

Based on the correlation and stepwise regression analyses presented in this dissertation, it is possible to assemble an ideal configuration for "the interorganizationally adaptive organization." This configuration is described in

Table 6-2. More specifically, the research in the dissertation indicates that while the competitive environment is certainly very important, organizational adjustments and environmental scanning have the strongest relationship with the level of interorganizational adaptation rather than the perceived characteristics of the environment.

Table 6-2
The Interorganizationally Adaptive Firm

High Levels of Organizational Adjustment
Firms making high levels of organizational changes may be expected to make high levels of interorganizational adjustments.
High Levels of Environmental Uncertainty
When managers perceive high levels of environmental uncertainty, firms may be expected to make high levels of interorganizational change.
High Levels of Environmental Munificence
When managers perceive high levels of environmental munificence, firms may be expected to make high levels of interorganizational change.
High Levels of Decentralization
Firms in which decision making is decentralized may be expected to make higher levels of interorganizational adjustments.
Prospector Product Market Strategies
Firms seeking new product innovations and new market opportunities may be expected to make higher levels of interorganizational adjustments.
High Levels of Environmental Scanning
Firms engaging in high levels of environmental scanning may be expected to make higher levels of interorganizational adjustments.
Shorter Tenure for Top Managers
Firms in which top managers have relatively short tenure may be expected to make higher levels of interorganizational adjustments.
Integrated Interorganizational Strategies
Firms pursuing integrated interorganizational strategies (stable networks and hierarchies) may be expected to make higher levels of interorganizational adjustments than firms pursuing disaggregated interorganizational strategies.

This configuration of environmental, organizational, managerial, and interorganizational characteristics is associated with the highest levels of interorganizational adjustment. Firms in similar situations and with comparable characteristics can be conceptualized as "interorganizational adapters" and may be expected to make more adjustments than firms that are more interorganizationally

static and that don't compare favorably with this ideal configuration. Managers may want to use this configuration as a model in determining when interorganizational adaptation is likely to be important and for creating firms which are interorganizational agile and flexible.

One of the most important contributions of this study is the evidence that organizational adjustments and environmental scanning activities are most closely related to adaptive interorganizational adjustments. Previous studies (especially Koberg, 1987; Koberg, Chesley, & Heppard, 1995) found that characteristics of the environment were the most important influence on organizational adaptation. This departure from previous findings is interesting because many of the theoretical discussions regarding interorganizational relationships and new organizational forms have implied that the high level of interorganizational change in firms today is most closely related to hypercompetitive environments. My data may indicate that much interorganizational adjustment is related to maintaining an internal fit between organizational characteristics and interorganizational relationships. This finding allows us to stress the importance of adaptive configurations when discussing levels of interorganizational adjustments.

Based on the results of this study, the two most important characteristics in predicting interorganizational flexibility or adjustment are the level of organizational adjustments made by the firm and the level of environmental scanning. This finding indicates that studies interested in interorganizational flexibility should focus on organizational flexibility and the degree to which a firm monitors and studies its external environment.

The relationship between the levels of organizational and interorganizational adjustment appears to refute arguments that interorganizational adjustments are made to buffer the internal organization from shifts in the environment or resource shortages (Pfeffer & Salancik, 1978). If this were the case, it would seem reasonable to expect that organizational and interorganizational adjustments would be inversely related. This is certainly not the case in this dissertation and the relationship found between organizational and interorganizational adjustments makes an interesting statement in the overall discussion of adaptation models and resource dependence theory.

The link between interorganizational adjustment and environmental scanning is also interesting because of the importance that external intelligence holds for top managers in strategy formulation and implementation (Hofer & Schendel, 1978; Ansoff, 1979; Miles, 1982). This study indicates that environmental scanning may be particularly critical in firms where competitive strategy requires a large number of interorganizational adjustments. It contributes to a recent resurgence of interest in environmental scanning and competitive intelligence in the academic literature (Elenkov, 1997) and in practitioner related books and articles (Kahaner, 1996; Business Week, 1996).

Interorganizational Strategy and Level of Adjustment

Interorganizational strategies, structures, and relationships are increasingly becoming viewed as a "fundamental strategic issue" (Buchko, 1994: 83). A real surprise in this study was that disaggregated or "market-like" interorganizational

strategies were not significantly related to higher levels of interorganizational adjustments than integrated or "hierarchical strategies." In fact, a significant negative correlation was found between disaggregated interorganizational strategies and the level of interorganizational adjustment.

The expectation that the highest level of interorganizational adjustments would be found in market-like interorganizational arrangements is based on arguments in the academic literature (eg. Miles & Snow 1986; 1994; Powell, 1990) and in more practitioner oriented articles and books (eg. Goldman, Nagel & Preiss, 1995). The consensus of most organizational writers and theorists is that firms involved in market-like, disaggregated interorganizational strategies have a greater number of inter-firm relationships and develop organizational and interorganizational routines which allow them to make higher levels of adjustments. Stated succinctly, in much of the conversation about flexibility and agility, these market-like interorganizational strategies are expected to be associated with interorganizationally flexible firms. Hierarchical interorganizational strategies are described as more interorganizationally static.

The surprising relationship I found which runs contrary to these common expectations regarding interorganizational flexibility may arise for a number of different reasons. First, the notion of coherent interorganizational strategies is relatively new. While managers confidently report that they have a particular interorganizational strategy, there may be a time-lag between the implementation of strategies and when higher levels of adjustment can be empirically observed.

Second, firms pursuing market-like interorganizational strategies may be finding that ties with multiple organizations are constraining their ability to make high levels of adjustment. Paradoxically, interorganizational strategies which are often intended to increase the flexibility of organizations are having very much the opposite effect. Perhaps, agility or flexibility (as measured by the number of interorganizational adjustments) is not to be gained by disaggregated interorganizational strategies.

> "I wouldn't say that most of my clients are entering a large number of relationships with other firms in order to be flexible. When they want flexibility, they tend to limit the number of deals they have to make and they do business with companies that have had dealings with in the past...where a level of trust and communication have developed...My clients who look for many different partners and high level of turnover in those partners seem to have cost savings as their goal. They look for the company with the lowest cost and they go with them (High Technology Consultant)."

In fact, some writers on institutional theory (eg. DiMaggio & Powell, 1983) and structuration theory (eg. Giddens, 1979) also suggest that high levels of interorganizational relationships may constrain the ability of firms to make adjustment and decrease their overall capability to adapt. Buchko (1994: 102), in particular, makes the following argument regarding market-like interorganizational strategies and flexibility or a firm's adaptive capacity related to strategic transformations:

> "As network structures develop over time, there is an increased likelihood that institutionalization will occur in tandem with the development of the network and that certain features of institutional structures will affect organizations...The results of exploratory research...suggests that the institutionalization of interorganizational networks may indeed present an barrier to strategic transformation efforts."

This dissertation may cause those who have speculated on the inherent agility and flexibility of market-like, virtual organizations to re-think some of their assumptions, at least at the interorganizational level. Certainly, disaggregated or market-like interorganizational strategies have a number of advantages. Organizational learning and lower organizational costs are examples often cited in the literature. However, this study indicates that interorganizational flexibility is not one of the advantages that organizations with disaggregated interorganizational strategies may expect to accrue. It appears that Chesbrough and Teece were correct when they argued that "virtual is not always virtuous" (1996; 65).

INTERORGANIZATIONAL ADJUSTMENTS AND PROFITABILITY

Another potentially important finding from this study is that the level of interorganizational adjustment explain a significant (albeit small) amount of variance in firm performance. Thus, there is at least limited support from this study for the idea that in rapidly changing industries, higher levels of adjustment are related to higher levels of profitability. When all adjustments (both

organizational and interorganizational) are included, nearly 2.5% of the overall variance in return on investment can be accounted for. In the aerospace industry, over 5% of the overall variance in return on investment is accounted for in the regression equation.

Even when all of the shortcomings of self-reported ROI are considered, this finding is of interest, particularly in the evolving discussion of continuous change strategies. It's important to note that this study only examines the aggregate level of interorganizational adjustment; it does not judge the quality of those adjustments. But this study offers a rudimentary level of support for advocates of continuous change strategies in very competitive environments. It is interesting to think about why this might be true (firms are enacting more favorable environments; managers are making appropriate interorganizational changes to maintain internal and external fit; firms are making many changes to remain flexible and easily adjust when it is critical to do so). Additional work on the link between high levels of adjustment and firm performance is certainly an important area for future research.

DYNAMIC NETWORK CHARACTERISTICS

This dissertation's efforts to validate Miles & Snow's (1986) dynamic network characteristics (vertical disaggregation, market intermediaries, payment for results, and broad access information systems) are mixed. Some limited support for the description of dynamic network characteristics is found but there is clearly a need to improve our descriptions of disaggregated interorganizational

strategies. Toward that end, this dissertation expands Miles & Snow's characterization of network arrangements by expanding the notion of personal contact.

Trust in Market-Like Interorganizational Strategies

This study makes a contribution to the description of market-like interorganizational relationships by adding an additional characteristic, "trust based on current information." In Miles and Snow's original discussion, the issue of trust was made an aspect of broad access information systems. In earlier research (Heppard, Koberg, & Chesley, 1996) and in the pilot studies for this project, it became clear that trust based on current information and broad access computer systems was only part of the CEO's conception of trust. It seemed that broad access computer information systems were primarily associated with automated ordering systems and just-in-time inventory approaches. These computer information systems were not typically associated with efforts to provide information on the current status of an interorganizational relationship.

> "We use the information systems primarily to keep our inventories of production materials at good levels. I think those systems are important for our inventory and production guys but they don't mean much to me or the rest of the company. Most of our areas rely on personal contact with other companies for current information...that means lots of e-mail, phone calls, and airline tickets. I wish I could show you my bills for those things (Aerospace Industry CEO)."

In market-like interorganizational strategies, firms typically do not make long term commitments to any particular interorganizational relationship. Because this long term commitment is absent, current information becomes very important in developing mutual confidence between these organizations. Rather than erecting costly legal and contractual protections often cited by economic theorists (Williamson, 1975), this study found that firms often focused on maintaining current information about their interorganizational relationships. Typically this information was gathered by members of the organization through high levels of communication and personal contact with members of other companies.

Personal Contact

The emphasis on personal contact in interorganizational relationships also became clear in the investigation of whether firms used contractual mechanisms and payment for results to motivate and monitor firms with which that they had relationships. Miles and Snow predicted that firms involved in disaggregated interorganizational relationships would rely on market mechanisms and specific terms in their contracts or letters of agreement with other firms to hold the major functions of the network together rather than personal supervision and progress reports (1986; 1994).

In this study, market mechanisms and payment for results did not fit well with the other characteristics of market-like interorganizational strategies. While the other characteristics identified by Miles & Snow were highly correlated in the

study, the payment for results characteristic was not. It also had the lowest factor score of all the characteristics considered. For these reasons, and because of comments made by CEOs in the study, it is recommended that this characteristic be eliminated from the discussion of market-like interorganizational strategies.

> "Except for our most simple exchanges, we rely on a great deal of interaction with our suppliers or partners. Now I'm not saying that I do that interaction...it comes from the people in the organization that are closest to that particular relationship. But we do really take a hands on approach in our dealings with other firms that are making contributions to our product. I wouldn't be comfortable letting things drift on auto-pilot (Electronics Components Industry CEO)."

Predicting CEO Reported Interorganizational Strategy

Another way to assess the validity of Miles & Snow's dynamic network characteristics was to determine if it was possible to predict a firm's self-reported interorganizational strategy by comparing CEO responses to Miles & Snow's ideal profile of firms with disaggregated interorganizational strategies. The results of this effort were disappointing. Even after considering how closely a firm matched each of the characteristics in the ideal profile, the model was only slightly better than chance at predicting the interorganizational strategy reported by CEOs.

This finding points out one of the most important weaknesses in the on-going discussion of interorganizational strategies, which is the lack of valid and coherent descriptions and measures. There is clearly a considerable amount of

work which needs to be done in order to allow researchers and managers to describe and predict interorganizational strategies with a high level of confidence. Just as Miles and Snow's (1978) typology of product market strategies was of critical importance in developing our understanding of organizational strategy, further development of typologies and measures of interorganizational strategy are vital in understanding strategic approaches which involve high levels of interorganizational interaction and adjustment.

FUTURE RESEARCH DIRECTIONS

In addition to the interesting issues for future research that been raised elsewhere in this chapter, there is a need to establish a more expansive agenda for the study of interorganizational relationships. The broader issues that need to be addressed concern the evolution of interorganizational relationships over time which will require longitudinal research. Other interesting projects might be stimulated by a renewed interest in control strategies, study of the relationship between new product innovation and adaptive interorganizational adjustments, and international interorganizational relationships. A final issue suggested for future research involves investigating interorganizational adjustments from other well-known theoretical perspectives.

Longitudinal Studies

This exploratory study of interorganizational adjustments and interorganizational strategies approached the issue with a cross-sectional research design. Clearly organizational and interorganizational routines can be expected to play an important role in selecting the way a firm deals with interorganizational adaptation and adjustment over time (Miles & Snow, 1978; Nelson & Winter, 1982). Future studies should examine the evolution of adaptive interorganizational adjustments longitudinally and develop a body of knowledge regarding interorganizational routines. Long term studies focusing on organizational adaptation (eg. Goes & Meyer, 1995) provide a useful model for this type of research.

Interorganizational Control

As the number of interorganizational relationships proliferate, it is expected that managers and researchers will become increasingly interested in investigating interorganizational control systems that are necessary for planning, budgeting, cost control, performance evaluation, resource allocation, and employee motivation and reward (Simon, 1991). Because control has been explored to only a limited degree in strategic management (Huff & Reger, 1987), there is a great need for meaningful descriptions and typologies of interorganizational control.

This study used a control typology from the field of organizational communication (Tompkins & Cheney, 1985) to investigate linkages between

control approaches and adaptation. Although the study found no statistical relationship between control strategy and interorganizational adaptation, the typology of simple, bureaucratic, technical and concertive control strategies developed by Tompkins and Cheney (1985) seems promising, particularly in ethnographic or case study investigations (Barker, 1993) that might be done on interorganizational relationships and strategies. In the pilot study and interview phases of this dissertation, several CEOs made comments that suggested further work in this area would be promising:

> "It's difficult to classify the way we control and monitor things here. You ask if we have a control strategy. I've asked the same question myself! Most consultants seem fixated on measuring every activity and then statistically checking the results as if it was a production process. I guess that's a legacy from TQM, you know benchmarking, three sigma standards, etc. But that over-simplifies the idea of control; like it's only a production issue and it misses the point. Our control systems, to the extent I understand them, are better described using the classification in your survey than in simplistic constant improvement terms. Certainly your ideas about control are fuzzier, more about people, but I think they are closer to the reality of how things are controlled here (Aerospace Industry CEO)."

It is also interesting to note that CEOs seemed to understand the Tompkins & Cheney control typology and had little trouble classifying their organizations. This observation is based on the pilot study and interviews done after the questionnaires were analyzed. My confidence in the Tompkins and

Cheney control typology is also based on the fact that no questionnaire returned in this survey left the control sections blank or made marginal comments about the usefulness or clarity of the typology (as they did for other sections of the questionnaire).

Interorganizational Innovation

An adaptation related issue of critical importance for managers and researchers in the fields of both organizational theory and strategic management is new product innovation. Innovation plays a central role in evolving theories about continuous change. The ability of firms to rapidly and continuously develop and introduce new products is seen as an important competitive advantage (Burgelman, 1991; Chakravarthy, 1997; Brown & Eisenhardt, 1997). This issue is of paramount importance in high technology industries such as computer industry (Bourgeois & Eisenhardt, 1988; Eisenhardt, 1989), or the three industries studied in this dissertation.

A logical extension of this dissertation would examine the subject of new product orientation within the context of the model of adaptive interorganizational adjustments. Specific research questions would explore linkages between interorganizational adjustments, interorganizational strategies, and new product innovations.

International Interorganizational Studies

One of the greater limitations of this dissertation is its lack of international investigation. Interorganizational relationships, particularly strategic alliances have been featured prominently in discussions of global strategy and international competitive advantage (Contractor & Lorange, 1988; Lei & Slocum, 1992; Yoshino & Rangan, 1995; Gomes-Casseres, 1996). Future studies on adaptive interorganizational adjustments should focus specifically on multi-national interorganizational linkages and global interorganizational strategies. It is important to determine whether the findings of this dissertation can be extended and included in the academic conversion about international issues and the concerns of multi-national firms. For example, it will be interesting to see if firms with global strategies are more or less interorganizationally adaptive than firms without global strategies.

Other Theoretical Perspectives on Interorganizational Adjustments

Finally, there are many reasons other than adaptation which have been discussed as motivations for firms making interorganizational adjustments or developing strategies with high levels of interorganizational relationships. Several other prominent theoretical explanations include organizational learning (Miles, Miles, & Snow, 1996), technology sharing (Lei & Slocum, 1992), access to international markets (Contractor & Lorange, 1988) , and the minimization of transaction costs (Williamson, 1975). It will be useful in future research to adopt various theoretical perspectives and reconsider the repertoire of

interorganizational adjustments developed in this dissertation. An interesting and important discussion regarding the relative costs and benefits of each of these adjustments from any of these theoretical perspectives would add much to the evolving and enlarging conversation about interorganizational relationships and adaptation.

BIBLIOGRAPHY

Aldrich, H. 1979. Organizations and environments. Englewood Cliffs, NJ: Prentice-Hall.

Aiken, M. & Hage, J. 1968. Organizational interdependence and Intraorganizational structure. American Sociological Review, 33: 912-930.

Alutto, J.A. & Hrebiniak, L.G. 1975. Research on commitment to employee organizations. Paper presented at the Academy of Management meetings, New Orleans.

Anderson, C.R. & Paine, F.T. 1975. Managerial perceptions and strategic behavior. Academy of Management Journal, 18(4): 811-823.

Andrews, K.R. 1971. The concept of corporate strategy. Homewood, IL: Dow-Jones-Irwin.

Ansoff, H.I. 1975. Managing strategic response by response to weak signals. California Management Review, 18(2): 21-33.

Ansoff, H.I. 1979. The changing shape of the strategic problem. In D.E. Schendel & C.W. Hofer (Eds), Strategic management: A new view of business policy and planning. Boston, MA: Little, Brown and Company.

Ansoff, H.I. 1988. The new corporate strategy. New York: John Wiley & Sons.

Anthony, R.N. 1965. Planning and control systems: A framework for analysis. Boston, MA: Division of Research, Harvard Business School.

Argyris, C. 1957. Personality and organization. New York: Harper.

Astley W.G. & Fombrun, C.J. 1983. Collective strategy: Social ecology of organizational environments. Academy of Management Review, 8: 576-587.

Astley, W.G. & Van de Ven, A.H. 1983. Central perspectives and debates in organizational theory. Administration Science Quarterly, 28: 245-273.

Aupperle, K.E., Carroll, A.B., & Hatfield, J.D. 1985. An empirical examination of the relationship between corporate social responsibility and profitability. Academy of Management Journal, 28: 446-463.

Bantel, K.A. & Jackson, S.E. 1989. Top management and innovations in banking: Does the composition of the top management team make a difference? Strategic Management Journal, 10: 107-124.

Barker, J.R. 1993. Tightening the iron cage: Concertive control in self-managing teams. Administrative Science Quarterly, 38: 408-437.

Barney, J.B. 1986. Types of competition and the theory of strategy: Toward an integrated framework. Academy of Management Review, 11: 791-800.

Barney, J.B. 1991. Firm resources and competitive advantage. Journal of Management, 17: 99-120.

Barney, J. B. 1995. Advances in strategic management: Theory and practice. Reading, MA: Addison-Wesley Publishing Company.

Barney, J.B. 1997. Gaining and sustaining competitive advantage. Reading MA: Addison-Wesley Publishing Company.

Barney, J.B. & Ouchi, W.G. Organizational economics. San Francisco: Jossey-Bass.

Barr, P.S. & Huff, A.S. 1997. Seeing isn't believing: Understanding diversity in the timing of strategic response. Journal of Management Studies, 34(3): 337-370.

Beekun, R.I., & Ginn, G.O. 1993. Business strategy and interorganizational linkages within the acute care hospital industry: An expansion of the Miles and Snow typology. Human Relations, 46(11): 1291-1317.

Bettis, R.A. & Hitt, M.A. The new competitive landscape. Strategic Management Journal, 16(Summer): 7-19.

Birnbaum, P.H. 1984. The choice of strategic alternatives under increasing regulation in high technology companies. Academy of Management Journal, 27(3): 489-510.

Boeker, W., & Goodstein, J. 1991. Organizational performance and adaptation: Effects of environment and performance on changes in board composition. Academy of Management Journal, 34(4): 805-826.

Botwinick, J. 1977. Aging and behavior. New York: Springer.

Bourgeois, L.J. 1984. Strategic management and determinism. Academy of Management Review, 9(4): 586-596.

Bourgeois, L.J. & Eisenhardt, K.M. 1988. Strategic decision processes in high velocity environments: Four cases in the microcomputer industry. Management Science, 34: 816-835.

Bracker, J.S., Keats, B.W., & Pearson, J.N. 1988. Planning and financial management among small firms in a growth industry. Strategic Management Journal, 9: 591-603.

Brittain, J.W. & Freeman, J. 1980. Organizational proliferation and density dependent selection. In J.R. Kimberly and R.H. Miles (Eds.), The organizational life cycle: Issues in the creation, transformation, and decline of organizations. San Francisco,: Jossey-Bass.

Brown, S.L. & Eisenhardt, K.M. 1997. The art of continuous change: Linking complexity theory and time-paced evolution in relentlessly shifting organizations. Administrative Science Quarterly, 42(1): 1-34.

Buchko, A.A. 1994. Barriers to strategic transformation: Interorganizational networks and institutional forces. Advances in Strategic Management, 10(B): 81-106.

Bullis, C. & Tompkins, P.K. 1989. The forest ranger revisited: A study of control practices and identification. Communication Monographs, 56: 287-306.

Burgelman, R.A. 1991. Intraorganizational ecology of strategy making and organizational adaptation: Theory and field research. Organization Science, 2: 239-262.

Burke, D.M. & Light, L.L. 1981. Memory and aging: The role of retrieval processes. Psychological Bulletin, 90: 513-546.

Burns, T. & Stalker, G.M. 1961. The management of innovation. Oxford: Oxford University Press.

Business Week. 1996. They snoop to conquer. 28 October: 172-176.

Buzzell, R.D. & Gale, B.T. 1987. The PIMS principles. New York, NY: The Free Press.

Cameron, K.S., Kim, W.U. & Whetton, D.A. 1987. Organizational effects of decline and turbulence. Administrative Science Quarterly, 32: 222-240.

Carter, N.M. 1990. Small firm adaptation: Responses of physicians' organizations to regulatory and competitive uncertainty. Academy of Management Journal, 33(2): 307-333.

Castrogiovanni, G.J. 1991. Environmental munificense: A theoretical assessment. Academy of Management Review, 16: 542-565.

Chakravarthy, B.S. 1982. Adaptation: A promising metaphor for strategic management. Academy of Management Review, 7: 35-44.

Chakravarthy, B.S. 1997. A new strategy framework for coping with turbulence. Sloan Management Review, Winter: 69-82.

Chakravarthy, B.S. & Doz, y. 1992. Strategy process: Managing corporate self-renewal. Strategic Management Journal, 13(Summer): 89-98.

Chandler, A.D. 1962. Strategy and structure. Cambridge, MA: MIT Press.

Channon, D. 1973. Strategy and structure in British enterprise. Boston: Harvard University Press.

Chesbrough, H.W. & Teece, D.J. 1996. When is virtual virtuous? Organizing for innovation. Harvard Business Review, 74(1): 65-73.

Child, J. 1972. Organizational structure, environment, and performance: The role of strategic choice. Sociology, 6: 1-22.

Child, J. 1977. Organization. New York: Harper & Row.

Child, J. 1997. Strategic choice in the analysis of action, structure, and environment: Retrospect and prospect. Organization Studies, 18(1): 43-76.

Cohen, J. 1977. Statistical power analysis fro the behavioral sciences. New York: Academic Press.

Conant, J.S., Mokowa, M.P., & Varadarajan, P.R. 1990. Strategic types, distinctive marketing competencies and organizational performance: A multiple measures-based study. Strategic Management Journal, 11: 365-383.

Contractor, F. & Lorange, P. 1988. Cooperative strategies in international business. Lexington, MA: Lexington Books.

Cyert, R.M. & March, J.G. 1963. A behavioral theory of the firm. Englewood Cliffs, NJ: Prentice-Hall.

Daft, R.L. 1989. Organization theory and design. St Paul, MN: West Publishing.

Daft, R.L. & Lewin, A. 1993. Where are the theories for new organizational forms? Organization Science, 1(1): i-vi.

Daft, R.L. & Weick, K.E. 1984. Toward a model of organizations as interpretation systems. Academy of Management Review, 9: 284-295.

D'Aveni, R.A. 1994. Hypercompetition: Managing the dynamics of strategic maneuvering. New York: The Free Press.

Davidow, W. H. & Malone, M.S. 1992. The virtual corporation: Lessons form the world's most advanced companies. New York: Harper Business.

Denzin, N.K. 1989. The research act. Englewood Cliffs, NJ: Prentice Hall.

Dess, G.G. 1987. Consensus on strategy formulation and organizational performance: Competitors in fragmented industries. Strategic Management Journal, 8: 259-277.

Dess, G.G. & Beard, D.W. 1984. Dimensions of organizational task environments. Administrative Science Quarterly, 29: 52-73.

Dess, G. G. & Robinson, R.B. 1984. Measuring organizational performance in the absence of objective measure: The case of the privately held firm and the conglomerate business entity. Strategic Management Journal, 5: 265-173.

Dexter, L.A. 1970. Elite and specialized interviewing. Evanston, IL: Northwestern University Press.

Dillman, D.A. 1978. Mail and telephone surveys: The total design method. New York: NY: Wiley.

DiMaggio, P.J. & Powell, W.W. 1983. The iron cage revisited: Institutional isomorphism and collective reality in organizational fields. American Sociological Review, 48: 147-160.

Dollinger, M.J. & Golden, P.A. 1992. Interorganizational and collective strategies in small firms: Environmental effects and performance. Journal of Management, 18(4): 695-715.

Donaldson, L. 1995. American anti-management theories of organization. Cambridge: Cambridge University Press.

Donaldson, L. 1996. For positivist organization theory. London: Sage Publications.

Doty, H.D., Glick, W. & Huber, G.P. 1993. Fit, equifinality and organizational effectiveness: A test of two configurational theories. Academy of Management Journal, 36: 1196-1250.

Dunbar, R.L.M. & Goldberg, W.H. 1978. Crisis development and strategic response in European corporations. Journal of Business Administration, 9(2): 139-149.

Duncan, R.B. 1972. Characteristics of organizational environments and perceived environmental uncertainty. Administrative Science Quarterly, 17: 313-337.

Dutton, J.E. 1993. Interpretations on automatic: A different view of strategic issue diagnosis. Journal of Management, 30: 339-357.

Dutton, J.E. & Jackson, S.E. 1987. Categorizing strategic issues: Links to organizational action. Academy of Management Review, 12: 76-90.

Edwards, R. 1979. Contested terrain. New York, NY: Basic Books.

Eisenhardt, K.M. 1989. Making fast strategic decisions in high velocity environments. Academy of Management Journal, 32: 543-576.

Eisenhardt, K.M. 1990. Speed and strategic decision making: How managers accelerate decision making. California Management Review, Spring: 39-54.

Eisenhardt, K.M. & Tabrizi, B.N. 1995. Accelerating adaptive process: Product innovation in the global computer industry. Administrative Science Quarterly, 40: 84-110.

Elenkov, D.S. 1997. Strategic uncertainty and environmental scanning: The case for institutional influences on scanning behavior. Strategic Management Journal, 18(4): 287-302.

Elster, J. 1984. Ulysses and the sirens: Studies in rationality and irrationality. Cambridge: Cambridge University Press

Emery, F.E. & Trist, E.L. 1965. The causal texture of organizational environments. Human Relations, 18: 21-31.

Erdos, P.L. 1983. Professional mail surveys. Malibar, FL: Krieger Publishing.

Finkelstein, S., & Hambrick, D.C. 1990. Top management team tenure and organizational outcomes: The moderating role of managerial discretion. Administrative Science Quarterly, 35: 505-538.

Fombrun, C.J. & Ginsberg, A. 1990. Shifting gears: Enabling change in corporate aggressiveness. Strategic Management Journal, 11: 297-308.

Fredrickson, J.W. 1986. The strategic decision process and organizational structure. Academy of Management Review, 11: 280-297.

Galbraith, C. & Schendel, D. 1983. An empirical analysis of strategy types. Strategic Management Journal, 4: 153-173.

Galbraith, J.R. 1973. Designing complex organizations. Reading, MA: Addison-Wesley.

Galunic, D.C. & Eisenhardt, K.M. 1996. The evolution of intracorporate domains: Changing divisional charters in high technology, multidivisional corporations. Organization Science, 7: 255-282.

Gersick, C.J. 1991. Revolutionary change theories: A multilevel exploration of the punctuated equilibrium paradigm. Academy of Management Review, 32: 274-309.

Giddens, A. 1979. Central problems in social theory: Action, structure, and contradiction in social analysis. Berkeley, CA: University of California Press.

Ginsberg, A. 1988. Measuring and modeling changes in strategy: Theoretical foundations and empirical directions. Strategic Management Journal, 9: 559-575.

Ginsberg, A. & Buchholtz, A. 1990. Measuring and modeling changes in strategy: Corporate responsiveness to radical change. Academy of Management Journal, 33: 445-477.

Glass, G.V. & Hopkins, K.D. 1984. Statistical methods in education and psychology. Boston, MA: Allyn & Bacon.

Gleick, J. 1987. Chaos. New York: Viking.

Glueck, W.F. 1980 Business policy and strategic management. New York: McGraw-Hill.

Goes, J.B. & Meyer, A.D. 1995. Strategic networks in health care: High technology responses to discontinuous change. Advances in Global High-Technology Management, 5(B): 137-169.

Goldman, S.L., Nagel, R.N. & Preiss, K. 1995. Agile competitors and virtual organizations. New York: Van Nostrand Reinhold.

Gomes-Casseres, B. 1996. The alliance revolution: The new shape of business rivalry. Cambridge, MA: Harvard University Press.

Granovetter, M. 1985. Economic action and social structure: A theory of embeddedness. American Journal of Sociology, 91: 481-510.

Gupta, A.K. & Govindarajan, V. 1984. Business unit strategy, managerial characteristics, and business unit effectiveness at strategy implementation. Academy of Management Journal, 27(1): 25-41.

Hage, J., & Aiken, M. 1969. Routine technology, social structure, and organizational goals. Administration Science Quarterly, 14: 366-377.

Hage, J., & Aiken, M. 1970. Social change in complex organizations. New York: Random House.

Hair, J.F., Anderson, R.E., Tatham, R.L., & Black, W.C. 1995. Multivariate data analysis. Englewood Cliffs, NJ: Prentice Hall.

Hambrick, D.C. 1981. Specialization of environmental scanning activities among upper level executives. Journal of Management Studies, 18: 299-320.

Hambrick, D.C. 1982 Environmental scanning and organizational strategy. Strategic Management Journal, 3: 159-174.

Hambrick, D.C. 1983. Some tests of the effectiveness and functional attributes of Miles & Snow's strategic types. Academy of Management Journal, 26: 5-26.

Hambrick, D.C. & D'Aveni, R. 1988. Large corporate failures as downward spirals. Administrative Science Quarterly, 33: 1-23.

Hambrick, D.C., & Finkelstein, S. 1987. Managerial discretion: A bridge between polar views of organizational outcomes. Research in Organizational Behavior, 9: 369-406.

Hambrick, D.C. & Mason, P. 1984. Upper echelons: The organization as a reflection of its top managers. Academy of Management Review, 9: 195-206.

Hamel, G. & Prahalad, C.K. 1994. Competing for the future. Boston: Harvard Business School Press.

Handy, C. 1990. The age of unreason. Boston: Harvard University Press.

Hannan, M.T. & Freeman, J. 1977. The population ecology of organizations. American Journal of Sociology, 82: 929-64.

Hannan, M.T. & Freeman, J. 1989. Organizational ecology. Cambridge, MA: Harvard University Press.

Harrison, R. 1970. Choosing the depth of organizational intervention. Journal of Applied Behavioral Science, 6: 181-202.

Haveman. H.A. 1992. Between a rock and a hard place: Organizational change and performance under conditions of fundamental environmental transformation. Administrative Science Quarterly, 37: 48-75.

Haveman, H.A., Meyer, A.D., & Russo, M.V. 1993. Institutional environments in flux: The impact of regulatory change on CEO succession and performance. Working paper. Duke University, Durham, N.C.

Heil, S. 1996. <Scott_Heil@gale.com> Ward's verification, 3 October.

Heppard, K.A., Chesley, J.A., & Koberg, C.S. 1996. Interorganizational strategies and adaptation. Do dynamic network characteristics increase adaptive latitude and firm performance? Unpublished manuscript, Presented at the Strategic Management Society Annual Conference, Phoenix, AZ.

Heppard, K.A. 1998. High expectations, supportiveness, and the management hall of fame: A conversation with Professor Raymond Miles. Journal of Management Inquiry (Forthcoming).

Higgins, J.M. 1983. Organizational policy and strategic management. Chicago: Dryden

Hitt, M.A. & Ireland, R.D. 1986. Relationships among corporate level distinctive competencies, diversification strategy, corporate structure, and performance. Journal of Management Studies, 23: 401-416.

Hofer, C.W. 1983. ROVA: A new measure for assessing organizational performance. Advances in Strategic Management, 2: 43-56.

Hofer, C.W. & Schendel, D.E. 1978. Strategy formulation: Analytical concepts. St Paul, MN: West.

Holsti, O.R. 1969. Content analysis for the social sciences and humanities. Reading, MA: Addison-Wesley Publishing Company.

Hoskisson, R.E., & Hitt, M.A. 1988. Strategic control systems and relative R&D investment in large, multiproduct firms. Strategic Management Journal, 9: 605-621.

Hoskisson, R.E., & Hitt, M.A. 1990. Antecedents of performance outcomes of diversification: A review and critique of theoretical perspectives. Journal of Management, 16: 461-509.

House, R., Rousseau, D.M., & Thomas-Hunt, M. 1995. The meso paradigm: A framework for the integration of micro and macro organizational behavior. Research in Organizational Behavior, 17: 71-114.

Hrebiniak, L.G. & Joyce, W.F. 1984. Implementing strategy. New York, NY: Macmillan Publishing company.

Hrebiniak, L.G. & Joyce, W.F. 1985. Organizational adaptation: Strategic choice and environmental determinism. Administrative Science Quarterly, 30: 336-349.

Huber, G.P. & Daft, R.L. 1987. The information environments of organizations. In F.M. Jablin, L.L. Putnam, K.H. Roberts & L. Porter (eds), Handbook of organizational communication: An interdisciplinary perspective. Newbury Park, CA: Sage: 130-158.

Huber, G.P., & Power, D.J. 1985. Retrospective reports of strategic level managers: Guidelines for increasing their accuracy. Strategic Management Journal, 6: 171-180.

Huff, A.S. 1981. Multilectic methods of inquiry. Human Systems Management, 2: 83-94.

Huff, A.S. 1990. Mapping strategic thought. Chichester: Wiley.

Huff, A.S. & Reger, R.K. 1987. A review of strategic process research. Journal of Management, 13(2): 211-236.

Huff, J.O., Huff, A.S., & Thomas, H. 1992. Strategic renewal and the interaction of cumulative stress and inertia. Strategic Management Journal, 13: 55-75.

Hunt, S.D., Sparkman, R.D., & Wilcox, J.B. 1982. The pretest in survey research: Issues and preliminary findings. Journal of Marketing Research, 19: 269-273.

Jarillo, J.C. 1988. On strategic networks. Strategic Management Journal, 9: 34-41.

Jennings, D. F., & Lumpkin, J.R. 1992. Insights between environmental scanning activities and Porter's generic strategies: An empirical analysis. Journal of Management, 18: 633-654.

Jennings, D., & Seaman, S.L. 1994. High and low levels of adaptation: An empirical analysis of strategy, structure, and performance. Strategic Management Journal, 15: 459-475.

Jones, G.R. 1995. Organizational theory. Reading, MA: Addison-Wesley.

Kahaner, L. 1996. Competitive intelligence. New York: Simon & Schuster.

Kanuk, L. & Berensen, C. 1975. Mail surveys and response rates: A literature review. Journal of Marketing Research, 12: 440-453.

Katz, R. 1981. Managing careers: The influence of job and group longevities. In R. Katz (ed), Career issues in human resource management. Englewood Cliffs, NJ: Prentice-Hall.

Kaufman, H. 1960. The forest ranger: A study in administrative behavior. Baltimore: Johns Hopkins University Press.

Koberg, C.S. 1987. Resource scarcity, environmental uncertainty, and adaptive organizational behavior. Academy of Management Journal, 30(4): 798-807.

Koberg, C.S. 1996. The questionnaire. Seminar handout, Dissertation Methods, University of Colorado, Boulder.

Koberg, C.S., Chesley, J.A., & Heppard, K.A. 1995. Adaptive latitude: Environment, organization, and individual influences. Unpublished manuscript, Presented at the Academy of Management Annual Conference, Vancouver, BC

Krippendorff, K. 1980. Content analysis: An introduction and its methodology. Beverly Hills, CA: Sage Publishing.

Labaw, P.J. & Rappeport, M.A. 1980. Advanced questionnaire design. Cambridge, MA: Abt Books.

Lant, T.K., Milliken, F.J. & Batra, B. 1992. The role of managerial learning and interpretation strategic persistence or reorientation: An empirical exploration. Strategic Management Journal, 13: 585-608.

Lawless, M.W. & Finch, L.K. 1989. Choice and determinism: A test of Hrebiniak & Joyce's framework on strategy-environment fit. Strategic Management Journal, 10(4): 351-365.

Lawless, M.W. & Moore, R.A. 1989. Interorganizational systems in public service delivery: A new application of the dynamic network framework. Human Relations, 42(12): 1167-1184.

Lawrence, P.R. & Dyer, D. 1983. Renewing American industry. New York: Free Press.

Lawrence, P.R. & Lorsch, J.W. 1967. Organization and environment: Managing differentiation and integration. Boston: Division of Research, Graduate School of Business Administration, Harvard University.

Levy, D. 1994. Chaos theory and strategy: Theory, Application, and managerial implications. Strategic Management Journal, 15(Summer): 167-178.

Lei, D. & Slocum, J.W. 1992. Global strategy, competence-building and strategic alliances. California Management Review, Fall: 81-97.

Likert, R. 1961. New patterns of management. New York: McGraw-Hill.

Linsky, A.S. 1975. Stimulating response to mailed questionnaires: A review. Public Opinion Quarterly, 38: 82-101.

Lorange, P. & Roos, J. 1992. Strategic alliances: Formation, implementation, and evolution. Cambridge, MA: Blackwell Business.

March, J.G. & Simon, H.A. 1958. Organizations. New York: Wiley.

Margerison, C., & Kakabadse, A. 1984. How American chief executives succeed: Implications for developing high potential employees. New York: American Management Association.

Marlin, D., Lamont, B.T. & Hoffman, J.J. 1994. Choice situation, strategy, and performance: A reexamination. Strategic Management Journal, 15(3): 229-239.

Maslow, A.H. 1943. A theory of human motivation. Psychological Review, 50: 370-396.

McGregor, D. 1960. The human side of enterprise. New York: McGraw- Hill.

Meyer, A., Tsui, A. & Hinings, C.R. 1993. Configurational approaches to organizational analysis. Academy of Management Journal, 36: 1175-1195.

Meyer, A.D. 1978. Management and strategy. In R. Miles and C. Snow (eds), Organizational strategy, structure, and process. New York: McGraw-Hill.

Meyer, A.D. 1982. Adapting to environmental jolts. Administrative Science Quarterly, 27: 515-537.

Meyer, A.D., Brooks, G.R. & Goes, J.B. 1990. Environmental jolts and industry revolutions: Organizational responses to discontinuous change. Strategic Management Journal, 11:Summer: 93-110.

Miles, R.E. 1965. Human relations or human resources. Harvard Business Review, 44(3): 148-163.

Miles, R.E. 1975. Theories of management: Implications for organizational behavior and development. New York: McGraw-Hill.

Miles, R.E. & Snow, C.C. & Pfeffer, J. 1974. Organization-environment: Concepts and Issues. Industrial Relations, 13: 244-264.

Miles, R.E. & Snow, C.C. 1978. Organizational strategy, structure, and process. New York, NY: McGraw-Hill Publishers.

Miles, R.E. & Snow, C.C. 1986. Organizations: New concepts for new forms. California Management Review, Spring: 62-73.

Miles, R.E. & Snow, C.C. 1994. Fit, failure and the hall of fame. New York, NY: The Free Press.

Miles, R.E., Creed, W.E.D. 1995. Organizational forms and managerial philosophies: A descriptive and analytic view. Research in Organizational Behavior, 17: 333-372.

Miles, R.E., Miles, G. & Snow, C.C. 1996. Good for practice: An integrated theory of the value of alternative organizational forms. Unpublished manuscript, Presented at the Strategic Management Society Annual Conference, Phoenix, AZ.

Miles, R.H. 1982. Coffin nails and corporate strategies. Englewood Cliffs, NJ: Prentice Hall.

Miller, D. 1986. Configurations of strategy and structure: Towards a synthesis. Strategic Management Journal, 7: 233-249.

Miller, D. 1988. Relating Porter's business strategies to environment and structure: Analysis and performance implications. Academy of Management Journal, 31: 280-308.

Miller, D. 1996. Configurations revisited. Strategic Management Journal, 17(7): 505-512.

Miller, D. & Chen, M.J. 1994. Sources and consequences of competitive inertia: A study of the U.S. airline industry. Administrative Science Quarterly, 39: 1-23.

Miller, D., & Friesen, P.H. 1977. Strategy making in context: Ten empirical archetypes. Journal of Management Studies, 14: 259-180.

Miller, D., & Friesen, P.H. 1978. Archetypes of strategy formulation. Management Science, 24: 921-933.

Miller, D., & Friesen, P.H. 1980. Momentum and revolution in organizational adaptation. Academy of Management Journal, 23: 591-614.

Miller, D., & Friesen, P.H. 1982a. Strategy-making and environment: The third link. Strategic Management Review, 4: 221-235.

Miller, D., & Friesen, P.H. 1982b. Structural change and performance: Quantum versus piece-meal approaches. Academy of Management Journal, 25(4): 867-892.

Miller, D., Lant, T.K., Milliken, F.J. & Korn, H.J. 1996. The evolution of strategic simplicity: Exploring two models of organizational adaptation. Journal of Management, 22(6): 863-887.

Miller, D. & Toulouse, J.M. 1986. Chief executive personality and corporate strategy and structure in small firms. Management Science, 32: 1389-1409.

Milliken, F.J. 1990. Perceiving and interpreting environmental change: An examination of college administrators' interpretation of changing demographics. Academy of Management Journal, 33: 42-63.

Mintzberg, H. 1979. The structuring of organizations. Englewood Cliffs, NJ: Prentice-Hall.

Mintzberg, H. 1990. The design school: Reconsidering the basic premises of strategic management. Strategic Management Journal, 11(3): 171-195.

Negandhi, A.R., & Reimann, B.C. 1972. A contingency theory of organization re-examined in the context of a developing country. Academy of Management Journal, 15: 137-145.

Nelson, R. & Winter, S. 1982. An evolutionary theory of economic change. Cambridge, MA: Harvard University Press.

Nohria, N. 1992. Is a network perspective a useful way of studying organizations? In Networks and organizations, N. Nohria and R. G. Eccles, (Eds). Boston: Harvard Business School Press, 1-22.

Nohria, N. & Eccles, R. 1992. Networks and organizations: Structure, form and action. Boston: Harvard Business School Press.

Norburn, D. & Birley, S. 1988. The top management team and corporate performance. Strategic Management Journal, 9: 225-237.

Norusis, M.J. 1993. SPSS for windows users guide. Chicago: SPSS, Inc.

Nunnally, J.C. 1965. Psychometric theory. New York: McGraw-Hill.

Oliver, C. 1988. The collective strategy framework: An application to competing predictions of ispmorphism. Administrative Science Quarterly, 33: 543-561.

Oliver, C. 1990. Determinants of interorganizational relationships: Integration and future directions. Academy of Management Review, 15: 241-265.

Oster, S.M. 1990. Modern competitive analysis. New York: Oxford University Press.

Parnell, J.A. & Wright, P. 1993. Generic strategy and performance: An empirical test of the Miles and Snow Typology. British Journal of Management, 4: 29-36.

Payne, R.L. & Pugh, D.S. 1976. Organizational structure and climate. In Handbook of industrial and organizational psychology, M.D. Dunnette (Ed). Chicago, IL: Rand McNally, 1125-1173.

Pennings, J. 1981. Strategically independent organizations. In Hanbook of organizational design, P. Nystrom and W.H. Starbuck (Eds). London: Oxford University Press, 433-455.

Perlmutter, H.V. & Hennan, D.A. 1986. Cooperate to complete globally. Harvard Business Review, 64(2): 136-152.

Pfeffer, J. 1983. Organizational demography. Research in Organizational Behavior. Greenwich, CT: JAI Press.

Pfeffer, J., & Leblebici, H. 1973, December. The effect of competition on some dimensions of organizational structure. Social Forces: 52: 268-279.

Pfeffer, J., & Salancik, G.R. 1978. The external control of organizations. New York, NY: Harper and Row.

Podsakoff, P.M., & Organ, D.W. 1986. Self-reports in organizational research: Problems and prospects. Journal of Management, **12**: 531-544.

Pooley-Dias, G. 1972. Strategy and structure of French enterprise. Doctoral Dissertation, Harvard University.

Porter, M.E. 1980 Competitive strategy. New York: The Free Press.

Porter, M.E. 1985. Competitive advantage. New York: The Free Press.

Porter, M.E. & Fuller, M.B. 1986. Coalitions and global strategies. In Competition in global industries, M.E. Porter (Ed). Boston: Harvard Business School Press, 315-344.

Powell, T.C. 1992. Organizational alignment as competitive advantage. Strategic Management Journal, 13 (2): 199-134.

Powell, T.C. 1992. How much does industry matter? An alternative empirical test. Strategic Management Journal, 17: 323-334.

Powell, W.W. 1990. Neither market nor hierarchy: Network forms of organization. In Research in organizational behavior, B.M. Staw & L.L. Cummings (Eds). Greenwich, CN: JAI Press, 295-336.

Powell, W.W. 1992. Hybrid organizational arrangements. California Management Review, 30: 67-87.

Preim, R.L. 1990. Top management team group factors, consensus, and firm performance. Strategic Management Journal, 11(6): 469-478.

Randolph, W.A. & Dess, G.G. 1984. The congruence perspective of organizational design: A conceptual model and multivariate research approach. Academy of Management Review, 9: 114-127.

Reimann, B. 1973. On the dimensions of bureaucratic structure: An empirical reappraisal. Administration Science Quarterly, 18: 462-476.

Ring, P.S. & Van De Ven, A.H. 1992. Structuring cooperative relationships between organizations. Strategic Management Journal, 13: 483-498.

Romanelli, E. & Tushman, M.L. 1988. Executive leadership and organizational outcomes: An evolutionary perspective. In The executive effect: Concept and methods for studying top managers, D. Hambrick (Ed). Greenwich, CT: JAI Press, 129-146.

Root, F.R. 1988. Some taxonomies of international cooperative arrangements. In F.J. Contractor & P. Lorange (eds), Cooperative strategies in international business. Lexington, MA: Lexington Books: 69-80.

Rosenkopf, L. & Tushman, M.L. 1995. Network evolution over the technology cycle: Lessons from the flight simulation community. Working paper, Department of Management, University of Pennsylvania.

Rumelt, R.P. 1974. Strategy, structure, and economic performance. Boston: Division of Research, Harvard Business School.

Schendel, D.E. & Hofer, C.W. 1979. Strategic management: A new view of business policy and planning. Boston, MA: Little, Brown & Company.

Schermerhorn, J.R. 1975. Determinants of interorganizational cooperation. Academy of Management Journal, 18: 846-856).

Scott, W.R. 1987. Organizations: Rational, open, and natural systems (2nd edition). Englewood Cliffs, NJ: Prentice-Hall.

Sharfman, M.P. & Dean, J.W. 1991. Measuring and conceptualizing the environment: a multi-dimensional approach. Journal of Management, 17: 681-700.

Sharfman, M.P. & Dean, J.W. 1997. Flexibility in strategic decision making: Informational and ideological perspectives. Journal of Management Studies, 34:2: 191-217.

Shortell, S.M., Morrison, E., & Friedman, B. 1990. Strategic choices for America's hospitals: Managing in turbulent times. San Francisco: Jossey-Bass.

Simons, R. 1991. Strategic orientation and top management attention to control systems. Strategic Management Journal, 12: 49-62.

Simons, R. 1994. How top managers use control systems as levers of strategic renewal. Strategic Management Journal, 15: 169-189.

Smith, K. & Grimm, C. 1987. Environmental variation, strategic change, and firm performance: A study of railroad deregulation. Strategic Management Journal, 8: 363-376.

Snow, C.C. & Hrebiniak, L.G. 1980. Strategy, distinctive competence, and organizational performance. Administrative Science Quarterly, 25: 317-336.

SOLO Power Analysis. 1991. Los Angeles, CA: BMDP Statistical Software, Inc.

Spector, P.E. 1987. Method variance as an artifact in self-reported affect and perceptions at work: Myth or significant problem? Journal of Applied Psychology, 72(3): 438-443.

Spender, J.C. 1989. Industry recipes. Oxford: Blackwell.

Stacey, R.D. 1996, Complexity and creativity in organizations. San Francisco: Berrett-Koehler Publishers.

Stalk, G. & Hout, T.M. Competing against time: How time-based competition is reshaping global markets. New York: Free Press.

Standard and Poor's Industry Surveys. 1995a. Aerospace and air transport, 164(5): New York, NY: Standard & Poors Company.

Standard and Poor's Industry Surveys. 1995b. Electronics, 163(31): New York, NY: Standard & Poors Company.

Standard and Poor's Industry Surveys. 1995c. Health care products and services, 163(36): New York, NY: Standard & Poors Company.

Strabuck, W.H. 1981. A trip to view the elephants and the rattlesnakes in the garden of Aston. In A.H. Van de Ven and W.F. Joyce (eds), Perspectives on organizational design and behavior. New York: Wiley-Interscience, 167-198.

Starbuck, W.H. & Mezias, J.M. 1996. Opening pandora's box: Studying the accuracy of managers' perceptions. Journal of Organizational Behavior, 17: 99-177.

Staw, B.M. & Ross, J. Commitment in an experimenting society: A study of leadership in administrative scenarios. Journal of Applied Psychology, 65: 149-160.

Staw, B.M. & Szwajkowski, E. 1975. The scarcity-munificence component of organizational environments and the commission of illegal acts. Administrative Science Quarterly, 31: 439-465.

Stevens, J.M., Beyers J.M. & Trice, H.M. 1978. Assessing personal, role, and organizational predictors of managerial commitment. Academy of Management Journal, 21: 380-396.

Stimpert, J.L. 1992. Managerial thinking and large diversified firms. Unpublished doctoral dissertation, University of Illinois at Urbana-Champaign.

Streufert, S. and Swezey, R.W. 1986. Complexity, managers, and organizations. London: Academic Press.

Stubbert, C.I. 1989. Cognitive science: A missing link in strategic management. Journal of Management Studies, 26: 325-347.

Terraberry, S. 1968. The evolution of organizational environments. Administrative Science Quarterly, 12: 590-613.

Thomas, L.G. 1996. The two faces of competition: Dynamic resourcefulness and the hypercompetitive shift. Organization Science, 7(3): 221-242.

Thomas, H. & Venkatraman, N. 1988. Research on strategic groups: Progress and proposals. Journal of Management Studies, 25: 537-555.

Thompson, J.D. 1967. Organizations in action. New York: McGraw-Hill.

Thorelli, H.B. 1986. Networks: Between markets and hierarchies. Strategic Management Journal, 7: 37-51.

Tompkins, P.K., & Cheney, G. 1985. Communication and unobtrusive control in organizations. In Robert D. McPhee and Phillip K Tompkins (eds), Communication: Traditional themes and new directions. Newbury park, CA: Sage, 179-210.

Tootelian, D.H. & Gaedeke, R.M. 1987. Fortune 500 list revisited 12 years later: Still an endangered species for academic research? Journal of Business Research, 15: 359-363.

Tushman, M.L. & Anderson, P. 1986. Technological discontinuities and organizational environments. Administrative Science Quarterly, 31: 439-465.

Tushman, M.L., & Romanelli, E. 1985. Organizational evolution: A metamorphosis model of convergence and reorientation. In L. L. Cummings & B. M. Staw (eds.), Research in Organizational Behavior, 7: 223-262.

Ungson, G.R., James, C., & Spicer, B.H. 1985. The effects of regulatory agencies on organizations in work products and high technology/electronics industries. Academy of Management Journal, 28(2): 426-445.

Ungson, G.R. & Schwab, R.C. 1980. Relationships between boundary spanning activities and perceptions of the task environment and influence on organizational decisions. Unpublished Manuscript, University of Oregon, Eugene.

Utterback, J.M. 1994. Mastering the dynamics of innovation: How companies can seize opportunities in the face of technological change. Boston, MA: Harvard University Press.

Utterback, J.M. & Abernathy, W. 1975. A dynamic model of process and product innovation. OMEGA, 6: 639-656.

Utterback, J.M. & Brown, J. 1972. Monitoring for technical opportunities. Business Horizons, Oct.

Venkatraman, N. & Prescott, J.E. 1990. Environment-strategy coalignment: An empirical test of its performance implications. Strategic Management Journal, 11: 1-23.

Venkatraman, N. & Ramanujam, V. 1986. Measurement of business performance in strategy research: A comparison of approaches. Academy of Management Review, 11: 801-814.

Volberda, H.W. 1996. Toward the flexible form: How to remain vital in hypercompetitive environments. Organization Science, 7(4): 359-374.

Vroom, V. & Pahl, B. 1971. Relationship between age and risk taking among managers. Journal of Applied Psychology, 55: 399-405.

Ward's Business Directory of U.S. Private and Public Companies. 1994-1997. S.F. Edgar (ed.), Detroit, MI: Gale Research.

Weick, K.E. 1987. Perspectives on action in organizations. In Handbook of organizational behavior, J.W. Lorsch (Ed). Englewood Cliffs, NJ: Prentice-Hall, Chapter 2.

Wiersema, M.F., & Bantel, K.A. 1992. Top management team demography and corporate strategic change. Academy of Management Journal, 35: 91-121.

Wiersema, M.F., & Bantel, K.A. 1993. Top management team turnover as an adaptation mechanism: The role of the environment. Strategic Management Journal, 14: 485-504.

Williamson, O.E. 1975. Markets and Hierarchies: Analysis and antitrust implications. New York: The Free Press.

Williamson, O.E. 1985. The economic institutions of capitalism. New York: Free Press.

Wittington, R. 1988. Environmental structure and theories of strategic choice. Journal of Management Studies, 26(6): 521-536.

Woodward, J. 1965. Industrial organization: Theory and practice. London: Oxford University Press.

Yasai-Ardekani, M. 1986. Structural adaptations to environments. Academy of Management Review, 11: 9-21.

Yasai-Ardekani, M. 1989. Effects of environmental scarcity and munificence on the relationship of context to organizational structure. Academy of Management Journal, 32: 131-156.

Yoshino, M.Y. & Rangan, U.S. 1995. Strategic alliances: An entrepreneurial approach to globalization. Boston, MA: Harvard Business School Press.

Zajac, E. J., & Kraatz, M. S. 1993. A diametric forces model of strategic change: Assessing the antecedents and consequences of restructuring in the higher education industry. Strategic Management Journal, 14: 83-102.

Zajac, E.J., & Shortell, S.M. 1989. Changing generic strategies: Likelihood, direction, and performance implications. Strategic Management Journal, 10: 413-430.

Zammuto, R.F. 1983. Growth, stability, and decline in American college and university enrollments. Educational Administration Quarterly, 19: 83-99

APPENDIX A

Zero-Order Correlation Matrix

	TOTXIII	AGE	YRSPOS	EMPSR	IIID	TOTIIIA
TOTXIII	1.000	-.0577 (.297)	-.1918 (.000)	.0549 (.321)	-.0124 (.822)	-.1209 (.028)
AGE	-.0577 (.297)	1.000	.2767 (.000)	.0291 (.599)	-.0018 (.974)	-.0096 (.862)
YRSPOS	-.1918 (.000)	.2767 (.000)	1.000	-.2401 (.000)	-.0292 (.598)	.0579 (.295)
EMPSR	.0549 (.321)	.0291 (.599)	-.2401 (.000)	1.000	-.0592 (.284)	-.1445 (.009)
IIID	-.0124 (.822)	-.0018 (.974)	-.0292 (.598)	-.0592 (.284)	1.000	-.0534 (.335)
TOTIIIA	-.1209 (.028)	-.0096 (.862)	.0579 (.295)	-.1445 (.009)	-.0534 (.335)	1.000
TOTIIIB	.0535 (.336)	-.0437 (.433)	-.0349 (.530)	.0220 (.693)	.0853 (.125)	-.0242 (.664)
TOTIIIC	-.2183 (.000)	.1041 (.059)	.0205 (.711)	.0963 (.081)	.1189 (.031)	-.0414 (.454)
TOTIVA	.3444 (.000)	.0806 (.145)	-.2804 (.000)	.1658 (.003)	.0051 (.926)	-.2191 (.000)
TOTIVB	-.1395 (.011)	.0045 (.935)	.1014 (.066)	-.0425 (.442)	.0432 (.435)	.0824 (.136)
HURESVI3	.0117 (.832)	-.0500 (.366)	-.0551 (.319)	.1224 (.024)	-.0155 (.779)	.0590 (.286)
HUINVI4	.0759 (.169)	.0580 (.295)	-.1192 (.031)	-0515 (.352)	.0539 (.330)	-.0952 (.085)

Zero-Order Correlation Matrix (continued)

	TOTXIII	AGE	YRSPOS	EMPSR	IIID	TOTIIIA
TECVIIA2	.0756 (.171)	.1089 (.049)	-.0062 (.911)	.0638 (.248)	-.0012 (.982)	.0535 (.333)
CONVIIA4	.0045 (.935)	.0055 (.920)	.0184 (.739)	-.0790 (.153)	.0760 (.169)	-.0231 (.676)
TECVIIB2	.0098 (.859)	.0469 (.397)	-.0041 (.941)	.0474 (.392)	-.0588 (.288)	.0217 (.695)
CONVIIB4	.0410 (.458)	-.0330 (.551)	-.0249 (.652)	-.0812 (.142)	.1161 (.035)	-.0605 (.274)
ORGVIII	.1002 (.070)	.0399 (.471)	-.1352 (.014)	.1698 (.002)	.0844 (.127)	-.0019 (.972)
INORGIX	-.1206 (.029)	.0783 (.157)	.1584 (.004)	-.0182 (.743)	-.0539 (.330)	.1092 (.048)
TOTXII	.4256 (.000)	.0124 (.822)	-.1375 (.013)	.0322 (.560)	-.1018 (.065)	-.0136 (.806)
TOTV	-.0355 (.522)	.1053 (.057)	-.0305 (.583)	-.0495 (.371)	.0744 (.179)	-.0461 (.405)
DEFXI1	-.1462 (.008)	.0217 (.695)	.1106 (.045)	.0861 (.119)	-.0490 (.375)	.0158 (.775)
PROXI2	.2208 (.000)	.0084 (.880)	-.0683 (.217)	.0662 (.231)	.0243 (.661)	-.1172 (.034)
ANAXI3	-.0764 (.167)	-.0175 (.752)	-.0132 (.811)	-.1164 (.035)	.0486 (.379)	.0535 (.333)

Zero-Order Correlation Matrix (continued)

	TOTIIIB	TOTIIIC	TOTIVA	TOTIVB	HURESVI3	HUINVI4
TOTXIII	.0535 (.336)	-.2183 (.000)	.3444 (.000)	-.1395 (.011)	.0117 (.832)	.0759 (.169)
AGE	-.0437 (.433)	.1041 (.059)	.0806 (.145)	.0045 (.935)	-.0500 (.366)	.0580 (.295)
YRSPOS	-.0349 (.530)	.0205 (.711)	-.2804 (.000)	.1014 (.066)	-.0551 (.319)	-.1192 (.031)
EMPSR	.0220 (.693)	.0963 (.081)	.1658 (.003)	-.0425 (.442)	.1244 (.024)	-.0515 (.352)
IIID	.0853 (.125)	.1189 (.031)	-.2191 (.000)	.0432 (.435)	-.0155 (.779)	.0539 (.330)
TOTIIIA	-.0242 (.664)	-.0414 (.454)	.0991 (.075)	.0824 (.136)	.0590 (.286)	-.0952 (.085)
TOTIIIB	1.000	-.1945 (.000)	-.0991 (.075)	-.0001 (.999)	-.0246 (.658)	.0605 (.277)
TOTIIIC	-.1945 (.000)	1.000	-.1625 (.003)	.0490 (.376)	-.0446 (.420)	-.0274 (.620)
TOTIVA	.0991 (.075)	-.1625 (.003)	1.000	-.1411 (.010)	.0248 (.654)	.1852 (.001)
TOTIVB	-.0001 (.999)	.0490 (.376)	-.1411 (.010)	1.000	.0247 (.656)	-.1469 (.008)
HURESVI3	-.0246 (.658)	-.0446 (.420)	.0248 (.654)	.0247 (.656)	1.000	-.6644 (.000)
HUINVI4	.0605 (.277)	-.0274 (.620)	.1852 (.001)	-.1469 (.008)	-.6644 (.000)	1.000

Zero-Order Correlation Matrix (continued)

	TOTIIIB	TOTIIIC	TOTIVA	TOTIVB	HURESVI3	HUINVI4
TECVIIA2	-.1241 (.025)	.0560 (.311)	-.0064 (.909)	-.0111 (.841)	-.0773 (.162)	.0179 (.746)
CONVIIA4	.1367 (.014)	-.1085 (.049)	.0947 (.087)	-.1023 (.064)	.0787 (.154)	.0307 (.579)
TECVIIB2	.0427 (.442)	.0458 (.408)	.0036 (.948)	-.1057 (.776)	.0093 (.867)	-.0170 (.759)
CONVIIB4	.0052 (.926)	-.0983 (.075)	.0872 (.115)	-.1070 (.053)	.0727 (.188)	.0713 (.197)
ORGVIII	-.0221 (.692)	-.0505 (.361)	.1160 (.036)	-.0792 (.152)	.0604 (.274)	.1446 (.009)
INORGIX	-.0247 (.657)	.0352 (.525)	-.1884 (.001)	.0981 (.076)	-.0357 (.519)	-.1221 (.027)
TOTXII	-0374 (.502)	-.2672 (.000)	.2891 (.000)	-.0776 (.160)	-.0862 (.119)	.1372 (.013)
TOTV	.0082 (.884)	.1071 (.053)	.1619 (.003)	.0496 (.370)	.0563 (.309)	-.0180 (.745)
DEFXI1	-.0121 (.828)	.1005 (.069)	-.2390 (.000)	.0629 (.255)	-.0724 (.190)	-.0752 (.174)
PROXI2	.1981 (.000)	-.1237 (.025)	.2729 (.000)	-.1278 (.020)	.0890 (.107)	-.0321 (.562)
ANAXI3	-.1146 (.039)	.0106 (.848)	-.0239 (.666)	.0509 (.357)	-.0136 (.806)	.0759 (.170)

Zero-Order Correlation Matrix (continued)

	TECVIIA2	CONVIIA4	TECVIIB2	CONVIIB4	ORGVIII	INORGIX
TOTXIII	.0756 (.171)	.0045 (.935)	.0098 (.859)	.0410 (.458)	.1002 (.070)	-.1206 (.029)
AGE	.1089 (.049)	.0055 (.920)	.0469 (.397)	-.0330 (.551)	.0399 (.471)	.0783 (.157)
YRSPOS	-.0062 (.911)	.0184 (.739)	-.0041 (.941)	-.0249 (.652)	-.1352 (.014)	.1584 (.004)
EMPSR	.0638 (.248)	-.0790 (.153)	.0474 (.392)	-.0812 (.142)	.1698 (.002)	-.0182 (.743)
IIID	-.0012 (.982)	.0760 (.169)	-.0588 (.288)	.1161 (.035)	.0844 (.127)	-.0539 (.330)
TOTIIIA	.0535 (.333)	-.0231 (.676)	.0217 (.695)	-.0605 (.274)	-.0019 (.972)	.1092 (.048)
TOTIIIB	-.1241 (.025)	.1367 (.014)	-.0427 (.442)	.0052 (.926)	-.0221 (.692)	-.0247 (.657)
TOTIIIC	.0560 (.311)	-.1085 (.049)	.0458 (.408)	-.0983 (.075)	-.0505 (.361)	.0352 (.525)
TOTIVA	-.0064 (.909)	.0947 (.087)	.0036 (.948)	.0872 (.115)	.1160 (.036)	-.1884 (.001)
TOTIVB	-.0111 (.841)	-.1023 (.064)	-.1057 (.776)	-.1070 (.053)	-.0792 (.152)	.0981 (.076)
HURESVI3	-.0773 (.162)	.0787 (.154)	.0093 (.867)	.0727 (.188)	.0604 (.274)	-.0357 (.519)
HUINVI4	.0179 (.746)	.0307 (.579)	-.0170 (.759)	.0713 (.197)	.1446 (.009)	-.1221 (.027)

Zero-Order Correlation Matrix (continued)

	TECVIIA2	CONVIIA4	TECVIIB2	CONVIIB4	ORGVIII	INORGIX
TECVIIA2	1.000	-.3219 (.000)	.2345 (.000)	-.1637 (.003)	-.0125 (.821)	.0799 (.148)
CONVIIA4	-.3219 (.000)	1.000	-.0102 (.854)	.3356 (.000)	.1562 (.005)	-.0802 (.147)
TECVIIB2	.2345 (.000)	-.0102 (.854)	1.000	-.4021 (.000)	-.0275 (.619)	.0195 (.724)
CONVIIB4	-.1637 (.003)	.3356 (.000)	-.4021 (.000)	1.000	.1531 (.005)	-.1146 (.038)
ORGVIII	-.0125 (.821)	.1562 (.005)	-.0275 (.619)	.1531 (.005)	1.000	-.1531 (.005)
INORGIX	.0799 (.148)	-.0802 (.147)	.0195 (.724)	-.1146 (.038)	-.1531 (.005)	1.000
TOTXII	.0612 (.268)	-.0278 (.615)	.0689 (.213)	-.0132 (.811)	.1019 (.065)	-.0502 (.364)
TOTV	-.0177 (.750)	-.0100 (.857)	-.0925 (.094)	.0888 (.108)	.0210 (.705)	-.1288 (.020)
DEFXI1	.0765 (.166)	-.0810 (.143)	.0416 (.452)	-.1230 (.026)	-.0734 (.184)	.1676 (.002)
PROXI2	.0708 (.200)	.1117 (.043)	-.0053 (.923)	.0391 (.481)	.0751 (.174)	-.1104 (.045
ANAXI3	.0145 (.793)	-.0069 (.901)	-.0260 (.639)	.0739 (.181)	.0190 (.732)	-.0862 (.119)

Zero-Order Correlation Matrix (continued)

	TOTXII	TOTV	DEFX1	PROXI2	ANAXI3
TOTXIII	.4256 (.000)	-.0355 (.522)	-.1462 (.008)	.2208 (.000)	-.0764 (.167)
AGE	.0124 (.822)	.1053 (.057)	.0217 (.695)	.0084 (.880)	-.0175 (.752)
YRSPOS	-.1375 (.013)	-.0305 (.583)	.1106 (.045)	-.0683 (.217)	-.0132 (.811)
EMPSR	.0322 (.560)	-.0495 (.371)	.0861 (.119)	.0662 (.231)	-.1164 (.035)
IIID	-.1018 (.065)	.0744 (.179)	-.0490 (.375)	.0243 (.661)	.0486 (.379)
TOTIIIA	-.0136 (.806)	-.0461 (.405)	.0158 (.775)	-.1172 (.034)	.0535 (.333)
TOTIIIB	-.0374 (.502)	.0082 (.884)	-.0121 (.828)	.1981 (.000)	-.1146 (.039)
TOTIIIC	-.2672 (.000)	.1071 (.053)	.1005 (.828)	-.1237 (.025)	.0106 (.848)
TOTIVA	.2891 (.000)	.1619 (.003)	-.2390 (.000)	.2729 (.000)	-.0239 (.666)
TOTIVB	-.0776 (.160)	.0496 (.370)	.0629 (.255)	-.1278 (.020)	.0509 (.357)
HURESVI3	-.0862 (.119)	.0563 (.309)	-.0724 (.190)	.0890 (.107)	-.0136 (.806)
HUINVI4	.1372 (.013)	-.0180 (.745)	-.0752 (.174)	-.0321 (.562)	.0759 (.170)

Zero-Order Correlation Matrix (continued)

	TOTXII	TOTV	DEFX1	PROXI2	ANAXI3
TECVIIA2	.0612 (.268)	-.0177 (.750)	.0765 (.166)	-.0708 (.200)	.0145 (.793)
CONVIIA4	-.0278 (.615)	-.0100 (.857)	-.0810 (.143)	.1117 (.043)	-.0069 (.901)
TECVIIB2	.0689 (.213)	-.0925 (.094)	.0416 (.452)	-.0053 (.923)	-.0260 (.639)
CONVIIB4	-.0132 (.811)	.0888 (.108)	-.1230 (.026)	.0391 (.480)	.0739 (.181)
ORGVIII	.1019 (.065)	.0210 (.705)	-.0734 (.184)	.0751 (.174)	.0190 (.732)
INORGIX	-.0502 (.364)	-.1288 (.020)	.1676 (.002)	-.1104 (.045)	-.0862 (.119)
TOTXII	1.000	-.0265 (.632)	-.0976 (.077)	.0368 (.506)	.0367 (.507)
TOTV	-.0265 (.632)	1.000	-.0666 (.229)	.0172 (.756)	.0615 (.266)
DEFXI1	-.0976 (.077)	-.0666 (.229)	1.000	-.2973 (.000)	-.5073 (.000)
PROXI2	.0368 (.506)	.0172 (.756)	-.2973 (.000)	1.000	-.5482 (.000)
ANAXI3	.0367 (.507)	.0615 (.266)	-.5073 (.000)	-.5482 (.000)	1.000

APPENDIX B

RESEARCH SURVEY INVESTIGATING RELATIONSHIPS BETWEEN ORGANIZATIONS

Confidential Questionnaire

- ***Please circle the appropriate answers or fill in the blanks.***
- ***It should take about 15 minutes to complete the questionnaire.***
- ***If you are uncertain of your answer, please indicate your best estimate of the correct answer.***

I. Background Information
Below are some questions which will provide background information for this study.

1. Sex
   1. MALE
   2. FEMALE

2. What is your age in years?
   1. 30 OR UNDER
   2. 31 - 40
   3. 41 - 50
   4. 51 - OVER

3. What is the highest educational level you have achieved?
   1. HIGH SCHOOL
   2. ASSOCIATE DEGREE
   3. BACHELORS DEGREE
   4. MASTERS DEGREE
   5. PH.D.

4. How many years have you been with this company?
   1. LESS THAN 1 YEAR
   2. 1 TO 2 YEARS
   3. 3 TO 5 YEARS
   4. 6 TO 10 YEARS
   5. 11 TO 15 YEARS
   6. 16 TO 20 YEARS
   7. OVER 20 YEARS

5. How many years have you been in your present position?
   1. LESS THAN 1 YEAR
   2. 1 TO 2 YEARS
   3. 3 TO 5 YEARS
   4. 6 TO 10 YEARS
   5. 11 TO 15 YEARS
   6. 16 TO 20 YEARS
   7. OVER 20 YEARS

6. In what year was your company founded? _____

7. Approximately how many employees are there in your firm? _____

8. Average annual change in number of **employees** over the last 3 years:

___DECLINING
___STABLE
___<10% GROWTH ANNUALLY
___ 10-25% GROWTH ANNUALLY
___ > 25% GROWTH ANNUALLY

9. Average annual change in **sales** over the last 3 years:

___DECLINING
___STABLE
___<10% GROWTH ANNUALLY
___ 10-25% GROWTH ANNUALLY
___ > 25% GROWTH ANNUALLY

10. Average annual **profitability** (Return on Investment) over the last 3 years:

___NEGATIVE
___<5% ANNUALLY
___BETWEEN 5% and 10% ANNUALLY
___ BETWEEN 10% and 15% ANNUALLY
___ > 15% ANNUALLY

II. Competitive Strategy

Please indicate how important the following methods of competition are to your firm?

		1.....5 NOT IMPORTANT ... VERY IMPORTANT				
1.	Competition based primarily on overall cost leadership within the industry, that is, achieving low cost relative to competitors is	1	2	3	4	5
2.	Competition based primarily on achieving competitive advantage relative to competitors within the industry with regard to product, service, price charged to customers, or quality is	1	2	3	4	5
3.	Competition based primarily upon concentration on a rather narrow buyer group, product line or geographic market is	1	2	3	4	5
4.	Competition based primarily upon the breadth of our product line is	1	2	3	4	5

III. External Environment

A. Please indicate how available the following resources are for your firm:

	1.....5 PLENTIFUL ... SCARCE				
1. Capital	1	2	3	4	5
2. Skilled Labor	1	2	3	4	5
3. Material Supplies	1	2	3	4	5
4. Managerial Talent	1	2	3	4	5
5. Market Information	1	2	3	4	5

B. Please indicate how similar or different the products and services you offer are with regard to the following:

	1.....5 VERY SIMILAR ... VERY DIFFERENT				
1. Customers' buying habits	1	2	3	4	5
2. The nature of the competition	1	2	3	4	5
3. Market change and uncertainty	1	2	3	4	5

C. Below is a question concerning your relationship with competitors, suppliers, customers, labor and governmental regulatory bodies. **Please circle** the frequency of change in each item listed below:

	1 VERY FREQUENT CHANGE				5 VERY RARE CHANGE
1. Distributors of your product or services	1	2	3	4	5
2. Users of product or services	1	2	3	4	5
3. Suppliers of equipment, materials, and parts	1	2	3	4	5
4. Supply of labor (all types)	1	2	3	4	5
5. Competitors for suppliers (all types)	1	2	3	4	5
6. Competitors for customers	1	2	3	4	5
7. Government regulatory control	1	2	3	4	5
8. Public political attitude toward your industry	1	2	3	4	5
9. Development of new or improved production methods	1	2	3	4	5
10. Development of new or improved products and services	1	2	3	4	5

D. Listed below are three levels of price competition generally found in most industries. **Please circle the one** that most closely describes the level of price competition encountered by your firm:

1. Severe price competition from competitors or substitutes; 5-20 alternatives available for customers.
2. Little or moderate price competition from competitors or substitutes; 2-4 alternatives available for customers.
3. No price competition from competitors or substitutes; no real alternatives for customers.

IV. Internal Policies

A. Rate how often the following methods are used by your firm to gather information about its environment (factors external to your organization):

	1 NEVER				5 FREQUENTLY
1. Routine gathering of opinions from customers.	1	2	3	4	5
2. Explicit tracking of the policies and tactics of competitors.	1	2	3	4	5
3. Explicit tracking of the policies, tactics, and prices of suppliers.	1	2	3	4	5
4. Special market research studies.	1	2	3	4	5
5. Long term forecasting of sales, profits and the nature of markets.	1	2	3	4	5
6. Long term forecasting of the technology relevant to products and services in your industry.	1	2	3	4	5
7. Planning of long term investments.	1	2	3	4	5
8. Formalized evaluation of opportunities for new acquisitions, investment, & markets.	1	2	3	4	5
9. Formalized evaluation of threats from competitors and regulatory changes.	1	2	3	4	5

B. Which levels of management is usually responsible for **making decisions** of the following types?

	1 LOWER LEVEL MANAGERS	2	3 MID LEVEL MANAGERS	4	5 TOP LEVEL MANAGERS
1. Capital budgeting	1	2	3	4	5
2. New product introduction	1	2	3	4	5
3. Pricing of major product lines	1	2	3	4	5
4. Entry into major new markets	1	2	3	4	5
5. Hiring and firing senior personnel	1	2	3	4	5
6. Daily operating decisions	1	2	3	4	5
7. Acquisition of firms	1	2	3	4	5

V. Values and Attitudes

Please indicate the accuracy of the following five statements concerning your own values and attitudes:

	1 VERY ACCURATE				5 VERY INACCURATE
1. Becoming a success is a matter of hard work. Luck has very little to do with becoming a success.	1	2	3	4	5
2. Getting ahead largely means being at the right place at the right time.	1	2	3	4	5
3. For the most part, my firm's success or failure is controlled by forces too complex to understand or control.	1	2	3	4	5
4. I have found that I can control my firm's environment to a large extent.	1	2	3	4	5
5. Many times, I feel I have little or no influence over what happens inside my firm.	1	2	3	4	5

VI. Managerial Philosophies

Listed below are four managerial philosophies. These philosophies help determine your approach to dealing with the employees of your firm. **Please circle the one** that most closely describes your managerial philosophy.

1. A manager's basic task is to closely supervise and control subordinates, break tasks down into simple, easily learned operations, establish detailed work routines and procedures and enforce these firmly but fairly.

2. A manager's basic task is to make each worker feel useful and important, keep subordinates informed and listen to their suggestions and objections, and allow workers to exercise some limited self-direction and control on routine matters.

3. The manager's basic task is to make use of the organization's untapped human resources. The manager must create an environment in which all members contribute to the limit of their ability and must encourage full participation in all matters while continually broadening subordinate self-direction and self-control.

4. The manager's basic task is to prepare the organization's human and technical resources to respond effectively to current and future environmental demands, to make current and long-term investments in employee skills and to view employees as assets that must be profitably invested. Managers must give workers the opportunities to practice new skills and must be willing to invest in the development of employees in other firms with which the firm does business.

VII. Control

A. Internal Control

Listed below are four approaches for internal organizational control utilized by most firms and organizations. **Please circle the one** that most closely describes your firm's approach to internal control.

1. Our firm uses an internal control system which is based on the personal control of workers by the managers of the organization.

2. Our firm's internal control system is based on (or emerges from) the technology (such as an assembly line) used in the organization.

3. Our firm's internal control system is based on sets of written rules and rewards or punishments developed primarily by management.

4. Our firm's internal control system is developed by our employees through collaboration and mutual consent.

B. External Control

Listed below are four approaches for control in relationships with **other firms**. **Please circle the one** that most closely describes your firm's approach to external control.

1. Our firm's external control system is based on our managers' direct monitoring and personal direction of activities in other firms with which we do business.

2. Our firm's external control system is based on (or emerges from) the technology (such as automated ordering systems) which connects our firm with other firms with which we do business.

3. Our firm's external control system is based on sets of written rules or contracts and rewards or punishments developed primarily by managers of our firm the and firms with whom we do business.

4. Our firm's external control system is developed by our managers and employees and the managers and employees in other firms with whom we do business through on-going collaboration and mutual consent.

VIII. Organization Structure

Listed below are four primary internal structures utilized by most firms and organizations. **Please circle the one** that most closely describes your firm's internal structure.

1. Our firm arranges resources by functional specialty (manufacturing, marketing, accounting, finance, etc.) and then coordinates their specialized outputs with centrally devised plans and schedules.

2. Our firm arranges resources around a given product, service, or region. These divisions are essentially self-contained and have substantial operating authority.

3. Our firm deploys resources and centrally controlled groups of functional specialists to program groups or project teams as they are needed.

4. Our firm strives to create an internal market where various units of our firm buy and sell goods and services from other units of our firm at prices which are comparable to the external market.

IX Interorganizational Form

A. Listed below are four primary interorganizational forms or relationships utilized by most firms. These forms essentially define the way your firm relates to other organizations. **Please circle the one** that most closely describes your firm's dominant approach to relating to (or doing business) with other firms.

1. Our firm almost exclusively uses the external market by writing delivery orders and purchasing agreements with various vendors and suppliers.

2. Our firm forms dynamic, temporary alliances (typically less than one year) with independent firms drawn from a large pool of potential partners along our product value chain(s).

3. Our firm or a large core firm along our product value chain creates stable, long term (typically more than one year), market-based alliances with a limited set of partners along our product value chain(s).

4. Our firm owns most business elements and performs most activities along our product value chain(s) internally and has only very limited relationships with other firms.

X. Interorganizational Relationships

A. In deciding whether to begin or continue an interorganizational relationship, generally how important are each the following:

		1 NOT IMPORTANT				5 VERY IMPORTANT
1.	Financing in the early stages of a new product or service	1	2	3	4	5
2.	Reducing the costs of developing product or service innovations	1	2	3	4	5
3.	Reducing the risks of developing product or service innovations	1	2	3	4	5
4.	Gaining access to superior technology	1	2	3	4	5
5.	Gaining access to customer markets	1	2	3	4	5
6.	Gaining technological expertise	1	2	3	4	5
7.	Gaining managerial expertise	1	2	3	4	5
8.	Improving the organization's quickness and agility	1	2	3	4	5
9.	Obtaining new product innovations	1	2	3	4	5
10.	Maintaining or honoring existing relationships and informal agreements	1	2	3	4	5

B. **Please circle** the number (from the scale of 1-5) that best approximates the correct statement regarding your firm:

1. We perform all business functions related to our product in-house.	1 2 3 4 5	We "contract out" or "out source" to other companies most business functions related to our product.
2. We act independently in obtaining and coordinating the activities and services associated with our business.	1 2 3 4 5	We use market intermediaries or brokers to obtain and coordinate the activities and services associated with our business.
3. We use progress reports and personal supervision when dealing with companies which provide us with products or services.	1 2 3 4 5	We use contracts and payment for results when dealing with companies which provide us with products or services.
4. We **DO NOT** use broad access computerized information systems in dealing with our customers and suppliers.	1 2 3 4 5	We use broad access computerized information systems in dealing with our customers and suppliers.
5. Our trust of other businesses is based on our experience with them.	1 2 3 4 5	Our trust of other businesses is based on continuously updated information that can be mutually and nstantaneously verified.

XI. Organization Strategy

Listed below are four primary strategies utilized by most firms and organizations. **Please circle the one** that most closely describes your firm's primary strategy.

1. Our firm attempts to locate and maintain a secure niche in a relatively stable product or service area, and is not at the forefront of developments in the industry.

2. Our firm typically operates within a broad product-market domain that undergoes periodic redefinition, and values being "first to enter" in new product and market areas.

3. Our firm attempts to maintain a stable, limited line of products or services, while at the same time moving out quickly to follow a carefully selected set of the more promising new developments in the industry.

4. Our firm does not appear to have a consistent product-market orientation. Rather, our firm responds in those areas where it is forced to by environmental pressures.

XII. Organizational Adjustments

In this section, organizational adjustments refer to a broad range of changes in organizational procedures, processes, structure, etc., that are undertaken within an organization to maintain and improve its relationship with the environment. For the question below, please refer to the following categories of organizational adjustments:

Procedural Adjustments: Management-determined changes in rules, work procedures, work schedules, etc.

Personnel-Related Adjustments: Hiring and firing of personnel; changes in selection and training policies, etc.

Process Adjustments: Major changes in budget allocations; significant modifications of planning and control systems; changes in basic technology used, etc.

Structural Adjustments: Additions or major modifications to equipment and facilities; reorganization of departments, divisions, and/or programs, etc.

Strategic Adjustments: Changes in basic product or service offered; abandonment of major product/services; expansion of current markets; divestment, acquisitions, and so forth.

Within the period 1993-1995, how often did you make the following organizational adjustments as a direct response to actions by your suppliers, competitors, customers, government regulatory agencies and so forth? (Circle the appropriate response for each category of adjustment.)

	NEVER	RARELY (ONCE OR TWICE)	SOMETIMES (THREE TO FIVE TIMES)	FREQUENTLY (SIX TO TEN TEN TIMES)	VERY FREQUENTLY (MORE THAN TEN TIMES)
PROCEDURAL	1	2	3	4	5
PERSONNEL RELATED	1	2	3	4	5
PROCESS	1	2	3	4	5
STRUCTURAL	1	2	3	4	5
STRATEGIC	1	2	3	4	5

XIII. Interorganizational Adjustments

In this section, inter organizational adjustments refer to a broad range of changes in relationships between firms that are undertaken by an organization to maintain and improve its relationship with the environment. For the question below, please refer to the following categories of interorganizational adjustments:

Vendor and Supplier Adjustments: The development of new sources for routine delivery orders or purchase agreements or changes in terms or conditions of existing vendor and supplier relationships.

Short Term Alliance Adjustments: Initiations, discontinuations, or changes in important terms or conditions of short term contractual arrangements or alliances.

Cooperative Marketing, Distribution, or Production Adjustments: Major changes in cooperative agreements with other firms concerning the marketing, distribution, or production of your firm's goods or services.

Licensing and Equity Investment Adjustments: Initiations, discontinuations, or changes in important terms or conditions of licensing arrangements or equity investments in other firms.

Joint Venture Adjustments: Initiations, discontinuations, or changes in important terms or conditions of joint ventures.

Within the period 1993-1995, how often did you make the following interorganizational adjustments as a direct response to actions by your suppliers, competitors, customers, government regulatory agencies and so forth? (Circle the appropriate response for each category of adjustment.)

	NEVER (ONCE OR TWICE)	RARELY (THREE TO FIVE TIMES)	SOMETIMES (SIX TO TEN TEN TIMES)	FREQUENTLY (MORE THAN TEN TIMES)	VERY FREQUENTLY
VENDOR & SUPPLIER	1	2	3	4	5
SHORT TERM ALLIANCE	1	2	3	4	5
COOPERATIVE MARKETING, DISTRIBUTION OR PRODUCTION	1	2	3	4	5
LICENSING & EQUITY INVESTMENT	1	2	3	4	5
JOINT VENTURE	1	2	3	4	5

We welcome any additional comments on the back page of this questionnaire.
Thank you for your participation!